

# THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—43RD YEAR

SYDNEY, SATURDAY, JANUARY 14, 1956

No. 2

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## The Beattie-Smith Lectures.<sup>1</sup>

(University of Melbourne.)

### RECENT WORK IN HYPNOSIS AND ITS RELATION TO GENERAL PSYCHIATRY.

By AINSLIE MEARES,  
Melbourne.

#### LECTURE II.

THIS evening I will continue the train of thought which I initiated last week. You will recollect that we are discussing the recent work in hypnosis. You will remember also that, in order to fulfil Dr. Beattie-Smith's object in founding these lectures, the aim has been to discuss the particular subject of hypnosis in such a way as to bring to light some of the general principles of modern psychiatry.

We will commence by examining the nature of the hypnotic state. Last week it may have appeared odd that during the whole lecture there was no attempt at definition. The reason for this omission is, of course, simple enough. Over sixty years ago, Liebault stated that hypnosis was

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a state of increased suggestibility. I think that most psychiatrists, when asked what hypnosis is, will still answer that it is a state of increased suggestibility. But if we examine this proposition, we see that it is neither a definition nor a theory. It is merely a description of the most prominent clinical feature of the hypnotic state. I do not say this to belittle Liebault. By offering a psychological explanation, he made a great advance over the organic concepts of hypnosis which were previously held. It is the matter of our own failure to make progress which I wish to emphasize.

So, in the absence of any definition, I think we can best understand the subject by considering some of the main clinical features of the hypnotic state. In this respect, we have already mentioned the increased suggestibility. We must be quite clear as to what is meant by this. Suggestion is the process which determines the uncritical acceptance of ideas. Thus an idea may be accepted on logical grounds by a critical intellectual process, or it may be accepted uncritically by suggestion. The essential element of suggestion is that the idea is not accepted according to any logical merits, but is accepted quite uncritically. We are all aware that this process operates in minor matters of everyday life. In hypnosis it is enormously increased. Almost any idea, no matter how illogical it may be, which is offered by the hypnotist, is accepted by the subject. I say almost any idea is accepted, because there is a limit to the situation. Even the deeply hypnotized subject retains some ability to defend himself psychologically. If the ideas

<sup>1</sup> Delivered at Melbourne on September 26 and October 2, 1955.

suggested are at variance with the subject's basic moral nature, it is believed that the subject reacts with anxiety, and the suggestions are not carried out. This means that a potential thief might be induced to steal under hypnosis, but not so an honest person. A woman of easy morals might be seduced, but not so a virtuous woman. The power of suggestion is very great, but it is not unlimited. Contrary to popular belief, the stage is never reached when all and every suggestion of the therapist is automatically accepted. This applies also in therapy, as regards both the relief of symptoms by hypnotic suggestion, and also the probing of psychological conflicts in hypnoanalysis.

Many of the most obvious aspects of hypnosis are actually secondary to this increased suggestibility. Thus the sleep, the amnesia and the age regression have all at different times been regarded as essential features of hypnosis. Although they may occur spontaneously, they are usually the result of direct or indirect suggestion.

There is another type of suggestion called post-hypnotic suggestion. In it the idea is suggested while the subject is hypnotized, and it is carried out later when the patient has awakened from this hypnotic state. By appropriate wording of the suggestion, the subject can be brought to fulfil the suggestion many weeks or months after waking from hypnosis. In such circumstances the subject can usually give no reason for having done the particular act. He just does it and that is all. Post-hypnotic suggestion is really the main mechanism of suggestive therapeutics.

Another feature of hypnosis is that there is often an oddness about the behaviour of the hypnotized person. It amounts to an exaggeration of movements and gestures. It sometimes gives the impression that the subject is acting, rather as if he is acting the part of a hypnotized person. Charcot thought that this behaviour was hysterical, and he believed that hypnosis was in fact a form of hysteria. Other observers have considered this apparent acting of the hypnotized person to be evidence of simulation, and they have believed, and I think some still believe, that hypnosis is a kind of act which the subject puts on at will. Others consider the matter as a manifestation of reduced motor ability due to the hypnotic state. My own feeling is that this odd behaviour should be regarded from quite a different point of view. Any form of behaviour has a number of components. There is the reality component; behaviour is directed to some purpose in terms of reality. But there is also an expressive component; so that the behaviour fulfils its purpose in reality, but at the same time serves as a medium of expression. This is seen in its simplest form in the behaviour of children. I believe that a great deal of the odd behaviour of the hypnotized person should be regarded in this light. It then becomes capable of meaningful interpretation.

The amnesia of hypnosis is a very variable phenomenon. Sometimes the patient has a crystal-clear memory of the whole hypnotic session, sometimes it is a complete black-out, more often there is patchy amnesia. The periods of amnesia coincide with the more disturbing events of the session. This applies especially to the ventilation of repressed conflicts, so it is clear that amnesia of this nature is purposive. It acts as an unconscious defence against the hurt of awareness of one's inner drives. On the other hand, amnesia may be the result of suggestion from the therapist. In either case the result is the same, in that the patient says he seems to have had a black-out.

Age regression is one of the most fascinating phenomena of hypnosis. It may occur as a result of suggestions from the therapist, or it may occur spontaneously. Spontaneous age regression frequently occurs in therapy when the patient is ventilating repressed material either verbally or in painting. There would seem to be two kinds of regression. Sometimes it seems that the patient is there, viewing some incident of childhood. At other times he seems to be actually reliving the incident, and experiencing again all the emotion which went with it.

*Rapport* is another feature of hypnosis. *Rapport* is the friendly feeling which the patient has to the doctor when he trusts him, and feels that he can help him. This emotional relationship is greatly enhanced in hypnosis.

The hypnotized patient accepts suggestions from the therapist, but from no one else. *Rapport* is an absolute prerequisite for the passive induction of hypnosis.

Freud saw in this intense rapport of hypnosis the equivalent of an erotic love relationship. He sought to explain hypnosis by postulating that it is analogous to falling in love. This theory explained very well the intense emotional bond between the subject and the hypnotist. It also explained the suggestibility of hypnotized persons, on the grounds that the subject went into a state of love in which his psychic identity became merged with that of the hypnotist, so that the slightest wish of the hypnotist would be automatically carried out. If this theory were true, we should expect to find significant differences in the problems of hypnotizing men and women. Clinically this is not so; and contrary to popular belief, men are just as easily hypnotized as women. It is also an established fact that some suggestible persons can be hypnotized by a hypnotist whom they not only do not love, but whom they actually hate. This in itself perhaps does not disprove Freud's theory. The general acceptance of the concept of ambivalence has led to the belief that love and hate can coexist in the same person for the same object at the same time. But we would expect these persons to be masochists, who relish the feeling of being overpowered, and this does not always seem to be so. Furthermore, Freud's theory breaks down completely in the face of hypnosis by mechanical means. It would be hard to imagine anyone falling in love with a metronome, or a hypnoscop. It seems that Freud, to whom we owe so much, actually fails us in the matter of hypnosis.

Ferenczi, the Hungarian psychoanalyst and follower of Freud, made a significant contribution to the theory of hypnosis. In 1909 he published a paper in which he considered hypnosis as a state of regression to a child-parent relationship. To those of you who are not familiar with psychiatric terms, "regression" means a return to an earlier type of behaviour. This mechanism is sometimes seen in schizophrenia, when the patient regresses to a childish way of doing things. Ferenczi's theory explains very well both the spontaneous regression and the rather childish behaviour which often occurs in hypnosis. But many of us would wonder at the basic idea of Ferenczi's theory—that the natural state of the child is one of automatic obedience to the parent. In fact most parents would disagree with this. It is also difficult to extend his theory to autohypnosis, and his theory, like Freud's, breaks down completely on the question of hypnosis by mechanical means.

Each of these theories is worthy of a much fuller exposition, but it is clear that none of them explains all the vagaries of the hypnotic state. By this approach, I fear that I may have misled some of you into suspecting that I myself may have something significant to offer on the subject. Unfortunately that is not the case. But just to relieve our feeling of general dissatisfaction with our present state of knowledge, I will venture the opinion that our future understanding of the hypnotic state will come through an anthropological rather than a psychological approach. It may easily be that in hypnosis we see a primitive mental mechanism functioning—a mechanism which perhaps governed the behaviour of pre-human man in the evolutionary period before the development of the ability of logical thought.

You can see that our theories as to the nature of hypnosis are as yet very incomplete. Nevertheless, we are able to use hypnosis to good effect in the treatment of nervous illness. It is used in two distinct ways: for the removal of symptoms by suggestion, and for the recovery of repressed conflicts to help the patient to insight. The recent work all relates to the latter method, and the enthusiasm of some American workers is such that they would seem to deny any useful role for direct suggestion. In my own mind I feel that this is a false perspective. Patients whose symptoms are maintained by habit or vicious circle mechanism, as opposed to active conflicts, do well with direct hypnotic suggestion. There is another group of patients who are equally rewarding. We are

often confronted with unfortunate people who, it would seem, have been just holding off nervous symptoms all their lives. They are often rather constitutionally inferior persons. With some additional environmental stress, sickness, a business failure, a pregnancy, they finally break down with anxiety symptoms. Such patients do not derive much help from psychotherapy because the relevant conflicts are already in their clear consciousness, but they get great relief from suggestive hypnosis. It seems that hypnosis can carry them through the difficult period, and allow their defence mechanisms to reassess themselves and so reestablish psychic equilibrium.

The new work in hypnosis is based on giving the patient insight into the conflicts and so resolving them psychologically. This is hypnoanalysis. Last week, we saw that the first step was the development of techniques of passive hypnosis, so that the patient does it himself; he just drifts into hypnosis with the therapist merely guiding him and helping him. After two or three sessions, when the patient is able to let himself go deeply enough into hypnosis, he is encouraged to talk.

In the hypnotic state the road to the unconscious is more direct, and very often the patient will ventilate the relevant conflicts without much delay. Such ventilation may be accompanied by great emotion, and sometimes the patient spontaneously regresses to the age at which the traumatic events occurred. The material obtained in this way is integrated with waking psychotherapy, and used to help the patient to insight.

As with any form of treatment, technical difficulties often arise. One of them is the problem of the patient who does not talk readily under hypnosis. Sometimes this is a psychological defence preventing the discussion of painful material even in hypnosis. In respect to this, a technique has been evolved here in Melbourne which is an aid in helping such patients.

A few years ago I was treating a patient in hypnoanalysis. On one particular occasion, while he was deeply hypnotized, it seemed that he wanted to express something, but was unable to do so. By chance I gave him a pencil, and told him to draw what was in his mind. To my surprise he started to draw all manner of things which I could not understand. While he was still hypnotized, I encouraged him to talk, and it turned out that the things he had drawn were connected with conflicts in his childhood which were intimately related to his present illness. Furthermore, these conflicts had not been elicited in other forms of treatment which the patient had undergone. This technique has been modified and improved. For various reasons it has been found that painting in black paint is more satisfactory than drawing with a pencil. Some patients will go on and on painting objects which are somehow connected with their unconscious conflicts. While the patient is still hypnotized, his verbal associations are obtained to the objects which he has painted. Some patients can express repressed material in this way much more readily than they can in waking psychotherapy, narcoanalysis or verbal hypnoanalysis. The material so obtained is later used in waking psychotherapy to help the patient to insight.

This type of treatment is known as hypnography. Sometimes it becomes complicated in various ways. I have explained that even the deeply hypnotized patient still retains some ability to defend himself psychologically. If the disclosure of psychic material in the painting is interpreted as a threat to the ego, then psychological defences develop to counter this threat. These may find expression in various manoeuvres of the patient to avoid painting. If the patient is reluctant to start, the difficulty can usually be overcome by telling him that it is his hand that paints it. By this means the patient is given the opportunity to defend himself by dissociation. It is his hand that does it, he has nothing to do with it. Sometimes the patient may at first deny knowledge of the object which he has painted, or the painting may be camouflaged in a rather childish way so that it may not be recognized by the therapist.

Besides the application to therapy in helping the patient to insight, this procedure may become an aid to our better understanding of the curious mental process of symbolism. Any painted object is, of course, a symbol. In hypnotic painting of this nature different types of symbolism may be seen. Some is representational, and aims at a likeness of the object. Other patients use conventional symbols. When representational or conventional symbolism is used, it is generally easy to comprehend the idea which the patient is trying to express. Other patients use universal symbols in the sense of Freud or Jung. But still others use what we may call individual symbols. It is found that many patients have their own particular symbols for expressing particular ideas. In subsequent sessions these symbols keep recurring with the same patient; but they never occur with other patients. These special symbols seem to belong to the particular individual. Their meaning becomes apparent only from the patient's associations. They would be given a completely wrong meaning if interpreted as universal symbols. Ordinarily the interpretation of symbols is a rather speculative business; but in hypnography the hypnotized patient can actually tell us the meaning of the symbol which he has used. By this means we not only come to understand the patient's conflicts, but gain a better understanding of the whole process of symbolism.

You can gather from what has been said of hypnosis, from the acceptance of quite illogical ideas, from the fulfilment of post-hypnotic suggestions after the subject has wakened, from the recovery of long-forgotten memories, from the production of weird symbolism—from these things you can gather that hypnosis is a very potent force. There is no doubt that it can be a potent force for good in the treatment of nervous illness, in the relief of pain and distress. But it is obvious that such a powerful force is potentially dangerous. Severe anxiety reactions may suddenly supervene in apparently harmless situations.

The hypnotized subject carries out suggestions from the hypnotist. We ordinarily think of suggestions being given verbally. But in actual fact suggestions are given by all manner of means, by gesture, expression, behaviour, by the intonation of the voice, even by the omission of things which might have been said or done. On account of the intensity of *rapport* in hypnosis, the subject is often extremely aware of the minutiae of the behaviour of the therapist. It is easy to see how inadvertent suggestions may be given by non-verbal or extra-verbal means. This may appear rather theoretical, but I can assure you that it is of great practical importance. A similar difficulty arises when words have a rather different meaning for the patient from their meaning for the therapist. A recently reported case exemplifies this. A patient developed an acute anxiety reaction during the induction of hypnosis. Subsequent inquiry disclosed that the patient equated the word sleep with death. This is quite understandable. Sleep and death are often equated in poetic writing: "To die; to sleep; to sleep; perchance to dream." Sleep and death are symbolically equated in the funerary rites of many religions. When the situation is viewed in this light, it is no mystery that the patient should develop anxiety when it was suggested that he should go to sleep.

Post-hypnotic suggestions may be a source of danger. If a person is unable to fulfil a post-hypnotic suggestion, either from inner psychic reasons, or from outer physical reasons, acute anxiety may result. The anxiety may manifest itself either as severe mental distress, or by way of bodily symptoms. An additional hazard in this situation is that a post-hypnotic suggestion is one which is carried out after the subject has wakened from hypnosis. This means that the therapist may not be on hand to give appropriate aid at the time of the anxiety reaction if this should occur. It is clear that casual hypnosis, and the unconsidered giving of post-hypnotic suggestions, are potentially dangerous to the subject. In suggestive therapeutics, in order to minimize these risks, there is a technique of using post-hypnotic suggestion in a non-specific way. The fact that the therapeutic suggestion is given in non-specific terms allows the ego a face-saving defence as it were, if the suggestion cannot be carried out. I think that this reduces

the power of the suggestion to some degree, but I have never known an anxiety reaction follow a post-hypnotic suggestion given in this way.

Another potentially dangerous situation arises when the hypnotized patient is ventilating repressed conflicts. This may be accompanied by the abreaction of great emotion. The expression of this emotion in weeping or screaming often has the effect of making lighter the degree of hypnosis. If care is not taken, a stage may be reached at which the patient suddenly becomes aware of what he is saying or thinking. The repressed material surges into consciousness and produces extreme anxiety.

A similar situation may occur in hypnography, if the hypnosis becomes too light and the patient suddenly becomes aware of the meaning of what he has painted. When a terrible idea is expressed in words as in verbal hypnoanalysis, simple defence mechanisms come into play, and the patient may be saved the hurt of awareness by denial or amnesia. But in hypnography, when the patient is actually confronted with the terrible idea expressed in painting, it cannot be so easily denied and forgotten, so the anxiety is likely to be more persistent, and more difficult to control.

There is another danger. We are all familiar with the idea that our choice of occupation is considerably influenced by unconscious psychological mechanisms. It seems that we tend to drift into activities which satisfy our psychological needs. Thus the theatre satisfies a need for display; the police force satisfies a need to be in authority, *et cetera*. Now if we examine the situation in hypnosis, we see that the hypnotist has an extremely close emotional relationship in the rapport which he has with the subject; he is also in a position which can be one of extreme domination of the subject. This combination of emotional intimacy and domination is a dangerous one. It has the elements of sadism. It is clear that the practice of hypnosis can provide an easy outlet for unconscious latent sadistic drives on the part of the therapist. Such a therapist is, of course, a danger to patients. This process also works the other way. Patients often come seeking hypnosis for the relief of their symptoms. On close inquiry it often becomes clear that it is not so much relief of symptoms which the patient is seeking, as hypnosis itself. This is by no means uncommon. The patient has really come for hypnosis in order to satisfy an unconscious psychological drive, and the patient is unaware that his symptoms are only a rationalization. Such patients have the urge to fulfil their masochistic yearnings in the surrender to domination which they expect to find in hypnosis. These people, of course, must be protected from themselves.

There are still other dangers. A person on the verge of mental illness often experiences fleeting feelings that certain people have some abnormal influence over him. These feelings are known as "ideas of influence". The untoward hypnosis of such a person can crystallize the latent ideas of influence, and precipitate the patient into frank insanity.

In England an awareness of these dangers has recently led legislators to bring in a law making stage shows of hypnosis illegal. I do not know if any similar legislation is contemplated in this country.

I am afraid that this has been a very inadequate presentation of the material. In these two lectures I have tried to discuss aspects of the recent work in hypnosis in such a way as to bring out some of the psychodynamic principles of general psychiatry. We have also seen something of the historical background of hypnosis. Over the centuries hypnosis has often been associated with the highest aspirations of man, with the spiritual and the healing; just as often it has been associated with the banal, the display of wondrous powers. These two tendencies are still associated with the practice of hypnosis today.

Medical hypnosis has undergone great changes. For a moment I was going to say advances; but medical history shows us time and again that changes are not always

advances. There have been many changes in belief as to the means by which hypnosis produces its healing effect. It is interesting to note how intimately these beliefs are related to the culture and sophistication of the times. In their temples the priests of ancient Egypt used the sacred sleep for curative purposes. It was the sleep given by the gods themselves that cured the supplicants. In the mysticism of the Middle Ages, trance states were usually attributed to demoniacal possession, or if a state of ecstasy supervened it was attributed to the intervention of the Saviour. In the decadent days of the French court prior to the Revolution, when all were seeking the sensory and exotic, the stage was set for such a theory as animal magnetism. In its turn the theory of healing by suggestion reflects the dawning scientific approach. Even Breuer's cathartic method, with its outpouring of emotion, to some extent may have been a product of the times. This was the Vienna of the 1890's, gay and emotional to the music of Strauss. Finally we come to our present belief, the use of hypnosis to cure by insight. Lay bare the inner conflicts, and there can be no nervous illness! It would seem logical to conclude the lecture on this triumphant note. But for a number of reasons I have my doubts, very grave doubts. The concept of insight is itself the product of a materialistic age. Many patients who certainly do not have insight lose their symptoms and remain well. Many patients, who appear to have good insight, remain plagued with nervous symptoms. I often feel that there is some other factor than insight—that insight itself is a receding mirage. All of us who do this work know of those lost in the desert seeking it. I feel that perhaps insight should be treated as a philosophical rather than as a psychological problem.

There are other doubts. I have emphasized the passivity of the therapist in the new work. We have also seen how past therapists have been mistaken. Sometimes I feel that we may be deluding ourselves about our passivity in the induction of passive hypnosis; that it may be nothing more than a disguised or perverted form of authority, a mere pseudo-passivity, and that in reality we may not be acting passively at all. I simply do not know.

There are other matters which confuse the whole issue, matters which I hardly like to mention. Sometimes strange things happen in hypnosis. Sometimes it seems that there is a transference of thought between therapist and patient which cannot be accounted for by suggestion, or by any known physical means. I am referring, of course, to extrasensory perception. The evidence of my own experience is very conflicting, it is just the worrying type of observation which one would like to ignore. Some experimentation in this field under controlled conditions has led to nothing definite. If such a thing does occur, the theoretical and practical implications would seem to be boundless. In the field of hypnotherapy, if the therapist really feels that he can help the patient, it would mean that the patient might experience suggestions to this effect by extrasensory means. If on the other hand the therapist was to feel that the patient would never get better, it could obviously have a very adverse effect on the patient. To me such an idea is really frightening. It is consistent with the fact that all successful medical hypnotists have been people of unlimited faith in their ability to help patients; and it is perhaps not inconsistent with Jung's idea of the collective unconscious. Some workers in America have been investigating the possibility of similar extrasensory phenomena—"telepathic leakage" as it is called—occurring in psychoanalysis. During phases of treatment in psychoanalysis there occur periods of intense emotional relationship between patient and therapist. This is not altogether dissimilar to the rapport of hypnosis. If "telepathic leakage" was proved, it would mean that we would have to revalue, not only the whole of our ideas on psychoanalysis, but also our ideas on any form of intensive psychotherapy. Do not think I wish to close on a nihilistic or pessimistic note; on the contrary, I mention these, my own personal doubts and misgivings, only as a further spur to all those who work in the field of nervous illness.

## THE TREATMENT OF FRACTURES BY INTRAMEDULLARY NAILING.

By H. M. SHAW,  
Melbourne.

FIXATION of fractures by means of an intramedullary nail was originally devised for the treatment of recent fractures of the middle third of the femoral shaft, but with increasing experience the method has been found to be applicable in the treatment of a wide variety of fractures. It is intended in this paper to present a discussion of the principles involved and of the advantages and disadvantages of this method, and to demonstrate that it has wide application in fracture treatment today. As a matter of interest, the principle of intramedullary fixation of fractures was recognized in the time of Hippocrates. In the earlier years of this century, fractures, particularly ununited fractures, were immobilized by the use of intramedullary pegs of ivory or bone, but largely because of infection the method fell into disrepute. It was left to Küntscher to develop this method of fixation using stainless steel nails produced by Krupp. The Küntscher nail was not used in Britain or America until the completion of hostilities in 1945.

It is hardly necessary in a paper of this kind to stress the three cardinal principles underlying all fracture treatment. These are adequate reduction of the fracture, fixation until union has occurred and restoration of function. In most fractures bony union is hastened by accurate reduction, though this is not essential for union to be achieved. Accurate anatomical reduction will make restoration of function less difficult, particularly in fractures of the lower limb, and will lessen the incidence of late complications, though there are some fractures in which early restoration of function is of more importance than the obtaining of perfect anatomical position; I refer to some fractures in proximity to the knee and elbow joints.

With regard to the more usual methods of immobilization, there are three factors which have to be considered in the restoration of function of an injured limb. First, there is a varying degree of muscle wasting, loss of muscle tone and neuro-muscular non-coordination involving the whole of the limb. Though this can be lessened by suitable exercises during the period of immobilization, it is always present. Second, there is joint stiffness of varying degree, which must be overcome, and which is due to periarticular fibroblastic adhesions forming during any period of prolonged immobilization. A further factor which must be considered in the production of joint stiffness, sometimes associated with instability particularly of the knee joint, is the effect of prolonged traction through the joint. Third, there is almost always some degree of circulatory insufficiency due to loss of tone in the vessel walls and musculature of the limb. This is shown by the presence of oedema and cyanosis of the dependent part. These factors must all be corrected, a process which may take weeks or months before it is complete, and in many cases the residual disability is considerable. Case I illustrates these points:

Miss A., a shop assistant, aged twenty-two years, was involved in a motor-car accident on February 28, 1953, and sustained a fracture of the mid-shaft of her right femur. She was treated at a country centre; her leg was immobilized in a Thomas splint, skeletal traction being provided by a wire through the tibial tuberosity. This was continued for seven months, when, as there was no evidence of union, a bone-grafting operation was performed. After this her leg was again immobilized in a Thomas splint for a further six months, and as progress in union continued to be slow she then commenced weight-bearing with the help of an ischial-bearing caliper which was used for nine months. Now, although the fracture is soundly united, her right knee is still extremely stiff, possessing only 25° of flexion movement. In addition, the joint is lax, and she has the feeling that it will give way. There is still considerable swelling of her leg below the knee and considerable wasting of her quadriceps muscles. She has not yet resumed work.

Thus, thirty months after her injury, this girl has a severe disability which is likely to be permanent. While it is not denied that in some cases immobilization with skeletal traction is necessary and may be the treatment of choice, the foregoing case history is quoted to stress the physical and economic disability which may follow prolonged treatment of this nature.

There are many fractures in which final restoration of function can be achieved satisfactorily by closed reduction and external fixation. There is also a group of fractures, many of them intrinsically unstable, in the treatment of which some form of open reduction appears necessary in order to restore adequate function. However, the more usual forms of internal fixation still require to be supplemented by external splinting with its consequent disadvantages. It is this which leads us to a consideration of some alternative form of fracture fixation. In the consideration of any new method this must be shown to be safe and to have advantages outweighing its disadvantages. Let us, then, turn our attention to a consideration of the advantages, disadvantages and complications of the method of fracture fixation in which a stainless steel intramedullary nail is used. It should be stated that in all the cases on which this paper is based, treatment has been by open reduction at the fracture site and introduction of the nail through the fracture site, in contradistinction to the method of closed reduction of the fracture and introduction of the nail under X-ray control as originally advocated by Küntscher.

The first advantage, and one of the greatest, is that an accurate anatomical reduction can be obtained and as a general rule adequately maintained without supplementary external fixation. Secondly, immobilization of the fracture by means of an intramedullary nail is sufficient to allow almost immediate mobilization of neighbouring joints. As a result the undesirable sequelae of prolonged external splinting are no longer encountered. Joint stiffness, muscle wasting and circulatory insufficiency are reduced to a minimum, and physiotherapy assumes a minor role in restoration of function. It has been further shown that in treatment of patients who sustain a fracture of the shaft of the femur, reduction and immobilization produce sufficient stability to allow weight-bearing two or three weeks after operation. The results of this are tremendous. The period of stay in hospital and convalescence is shortened, with benefit to the patient and, in these days of bed shortages, to the community. Financial hardship associated with prolonged immobilization is largely overcome, as a patient may return to suitable work within six weeks of injury, if necessary. These advantages are of great psychological benefit to the patient, and are productive of a sense of well-being and confidence.

There are also some advantages of a general nature to be considered. When early mobilization is made possible, the incidence of recumbency symptoms, pressure sores, urinary calculi and thrombotic and embolic accidents is greatly reduced. Nursing, particularly of patients with multiple fractures or with associated general disease, is made easier. Case II illustrates this point:

B., aged fifteen years, was admitted to hospital on March 17, 1955, after an accident in which he had suffered severe concussion and a fracture at the junction of the middle and upper thirds of the shaft of his right femur. His femur was immobilized on a Thomas splint with skeletal traction. On recovering consciousness he became confused and irrational, and it was found difficult to keep the Thomas splint in position. The fracture was eminently suitable for intramedullary fixation, and this was carried out one week after his admission to hospital. After operation he remained confused for a time, but nursing and immobilization of his fracture no longer presented a problem. He commenced weight-bearing three weeks after operation, and four weeks later he had a full range of knee movement and was walking without support of any kind (Figures I and II).

This case illustrates how the nursing and management of a patient suffering from a severe head injury associated with a fracture of the femur may be simplified by the use of an intramedullary nail.

These are all great advantages, since they affect the economy both of the individual and of the community.

What, then, are the possible disadvantages and complications of this method of treatment?

First, this method is applicable only when the effects of shock have been overcome and the patient is able to stand a major operative procedure. Associated general disease must be borne in mind when the patient's fitness for operation is assessed. Secondly, a simple fracture is deliberately converted into a compound fracture with the associated risk of infection. This risk is theoretically increased by the introduction of a metallic foreign body which traverses the whole length of the medullary canal of the involved bone. With the routine use of antibiotics in the post-operative period this risk does not seem unduly great.



FIGURE I.  
B., aged fifteen years. Pre-operative X-ray film shows an oblique fracture at the junction of the middle and upper thirds of the femoral shaft.

While minor wound infection has been encountered the writer has not met with any bone infection, and perusal of the literature indicates that widespread bone infection is a rare complication. Wound infection when it has occurred has not materially altered convalescence or management.

It was originally thought that the introduction of a large foreign body would cause damage to the bone marrow and to nutrient vessels running through the marrow cavity. In fact, Kuntscher nails of the shape commonly in use do not completely fill the marrow cavity. A Kuntscher nail running the full length of the femoral shaft displaces about one teaspoonful of fatty marrow. This is a relatively undifferentiated type of tissue which is rapidly regenerated, any damage done being transient and harmless. Similarly, as the nail does not completely fill the cavity, the intramedullary nutrient vessels must frequently escape damage. However, should these vessels be damaged, the alternative blood supply to the shaft of the femur is such that avascular necrosis is an extremely rare event. The blood supply of the shaft of the tibia is, however, more vulnerable. It will be remembered that the nutrient artery enters the bone at approximately the junction of the upper and middle thirds of the shaft, and that the lower half of the bone is devoid of muscle attachments. In fractures of the lower half of the shaft of the tibia, the lower fragment is separated from its nutrient vessel and is rendered relatively avascular. This is frequently the cause of delayed union or non-union. In a similar way, damage to the

nutrient vessel by an intramedullary nail may result in avascularity of the lower fragment and in delayed union of the fracture.

Critics of this method of treatment suggested that introduction of an intramedullary nail may be responsible for an increased incidence of fat embolism. In fact, it has been shown that fat embolism is no more frequent in fractures treated by intramedullary nailing than in those treated by closed reduction. When fat embolism has occurred, it has usually been shortly after the accident and prior to the introduction of the nail.

As a possible disadvantage in this method, we must consider any effect that the presence of the nail may have on callus formation. Kuntscher originally stated that callus formation was enhanced by the use of an intramedullary nail, but experience has shown him to be only partly correct. It is true that fractures of the femur treated in this way show an impressive amount of external callus formation at an early stage; but the fracture line remains visible, and consolidation may not be complete for six months or more. Further, this exuberant callus formation is not seen in such a great degree in fractures of the tibia or of the upper limb. The early formation of external callus may be due to two factors. The shaft of the femur is surrounded and supported by large muscle masses. The compressing action of these muscles involved in early weight-bearing together with increased blood flow is a stimulant to increased periosteal bone formation. The shaft of the tibia, on the other hand, is not surrounded in



FIGURE II.  
B., aged fifteen years; showing the position obtained after reduction and insertion of a Kuntscher nail.

this way, and so this factor is missing. Secondly, with this method of fixation of femoral fractures there must be a small amount of movement possible at the fracture site when weight-bearing is commenced. This movement acts as a stimulus to periosteal bone formation. In fractures of the tibia, on the other hand, owing to the shape of the medullary cavity, adequate immobilization is more difficult to obtain. In this case, should excessive movement occur, bone formation will be delayed rather than stimulated. In practice this has been found to be the case, and union of tibial fractures is not hastened by the use of an intramedullary nail.

Associated with the disadvantages, any complications resulting from this method of treatment must be considered.

The possibility of infection has already been discussed and will not be discussed further.

An attempt should be made before operation to assess the length and width of the medullary cavity of the affected bone, and a variety of nails should be available at the time of operation, a nail of the correct size then being selected. Should a nail of too great a diameter be chosen, it may become impacted in the medullary cavity, and its removal may present extreme difficulty. The use of too short or too thin a nail, on the other hand, will probably result in inadequate fixation and angulation of the fragments. This may be overcome by the use of external splintage to supplement the nail; but if this fault is unrecognized, it may lead to delayed union or non-union of the fracture. Occasionally in femoral fractures the nail has been found to bend when weight-bearing is commenced. The resultant deformity is easily corrected under "Pentothal" anaesthesia, and a walking caliper will be required until union has occurred. Late fracture of the nail has been reported, but has not been seen by the writer.



FIGURE III.

C., aged thirty-two years. A fracture in the mid-shaft of the femur, showing the position after open reduction and insertion of a Kuntscher nail.

Most of the disadvantages and complications outlined can be avoided or overcome by correct technique, by the routine post-operative use of antibiotics and by selection of suitable cases. It is the opinion of the writer that the advantages of this method of treatment in suitable cases, particularly for suitable fractures of the femoral shaft, outweigh its disadvantages, and that for some fractures it is now the treatment of choice.

We now come to a consideration of the indications for the use of an intramedullary nail in fracture fixation. In Kuntscher's first cases the fractures were transverse or short oblique, in the middle third of the shaft of the femur. However, in broad general terms it can be stated

that any recent fracture of the shaft of long bones can be treated in this way, provided that the nail used can obtain an adequate grip of the fragments above and below the fracture site. The grip obtained by a suitable nail depends upon several factors. First, it depends upon the site of the fracture and hence the length of the respective fragments. As a guide, transverse, oblique or spiral fractures can be treated in this way, provided that the fracture line lies (a) within the middle half of the shaft of the femur, (b) within the middle third of the shaft of the tibia, (c) not closer than five centimetres to the upper end of the shaft of the humerus or seven centimetres from its lower end, (d) not less than three centimetres from the upper end of the ulna, (e) in the middle third of the radius.



FIGURE IV.

C., aged thirty-two years: same patient as shown in Figure III. X-ray films taken eight weeks after operation, demonstrating exuberant external callus formation.

The second factor determining the grip obtained by an intramedullary nail is the shape of the medullary cavity itself. This cavity is never perfectly straight, but is slightly bowed, forward in the femur, laterally in the radius or the tibia. Furthermore, the medullary cavity is narrowest at about the mid-shaft of the bone, widening toward either extremity. If the fracture line lies proximal to the narrowest part of the medullary cavity, in some cases a sufficient grip may be obtained as the nail passes this isthmus, though as a general rule it is advisable to drive the nail into the cancellous tissue at the end of the distal fragment. The third factor determining the grip obtained is the extent of the cancellous tissue at the ends of the affected bone. This will vary with individual bones and at different ages, but can be estimated by careful pre-operative examination of radiographs. The last factor is the length of the nail itself. Too short a nail will obtain an inadequate grip of the lower fragment, with results which have already been discussed, while too long a nail may penetrate the articular cartilage of the joint distal to the fracture.

The principles underlying the treatment of recent fractures by intramedullary fixation having been briefly discussed, our attention must now be turned to these indications as applied to individual long bones, it being

understood that in each case the patient is in a fit state to undergo a major operative procedure.

#### The Femur.

Recent fractures of the middle half of the shaft of the femur, whether transverse or oblique, are eminently suitable for treatment by this method. Fractures lying outside these limits are not suitable, as the nail is unable to obtain sufficient grip on one or other fragment. However, in the treatment of suitable fractures it is thought that the advantages of intramedullary fixation far outweigh the disadvantages, and that this should now be the treatment of choice. Patients are able to start walking with or without a walking caliper two weeks after operation, and are usually fit to leave hospital ten days later. If necessary,



FIGURE V.

Mr. D., aged thirty-five years. Pre-operative X-ray film showing a fracture-dislocation of the head and surgical neck of the left humerus.

they can be returned to some suitable occupation within six weeks of operation. Case III illustrates this:

C., an engineer, aged thirty-two years, suffered a short oblique fracture of the mid-shaft of his left femur as a result of motor-car accident on August 9, 1954. Operation was performed on August 14, the fracture being reduced by open reduction and immobilized by the use of an intramedullary Kuntscher nail. No form of external splintage was used. The patient commenced weight-bearing with the aid of crutches two weeks after operation. Ten days later he left hospital walking with the aid of a stick. He was examined six weeks after operation, when he was walking without any form of support and without a limp. The tone of his muscles was good, he had a full range of knee movement, and there was no oedema of his leg. X-ray films at this stage showed abundant external callus formation, and he was pronounced fit to return to his normal occupation (Figures III and IV). The nail is still *in situ* and he has remained symptom-free.

This case illustrates the usual course that can be expected after treatment of a fractured femur by this method. Such a fracture treated by conservative methods may well require six months' treatment, with the prospect that there may be an appreciable residual disability on completion of the treatment. As was mentioned previously, the economic saving from the point of view of both patient and community is tremendous.

#### The Tibia.

Intramedullary fixation of fractures of the shaft of the tibia presents us with considerable technical difficulties which have been only partly solved, so that the advantages to be gained are not so great as in fractures of the femoral shaft. The medullary canal of the tibia is narrowest at the middle and widens considerably as each extremity of the bone is approached; this makes it difficult for a single nail to obtain an adequate grip of each fragment. The second difficulty lies in the introduction of a nail, which is carried out through an oblong window made in the cortex at the upper end of the tibia. Attempts have been made to overcome these difficulties by using curved nails and multiple nails; but the degree of immobilization obtained may still be insufficient, and supplementary external fixation may still be required. Moreover, the shaft of the tibia is not surrounded by powerful muscles as is the femur, and the compressing action provided by them is lost. As a result the early formation of periosteal callus described in fractures of the femur is not seen in fractures of the tibia. To sum up, it may be said that the use of intramedullary nails in the treatment of tibial fractures is associated with difficulties not met with in the treatment of fractures of the femur. At present it does not appear to offer any advantages over the more usual methods of treatment.



FIGURE VI.

Mr. D., aged thirty-five years; the same patient as shown in Figure V. Demonstrating the position obtained after open reduction and insertion of a Kuntscher nail.

#### The Humerus.

It is recognized that most fractures of the shaft are adequately treated by closed reduction. However, there is a small proportion in which closed reduction is unsuccessful or impractical, and in these open reduction and internal fixation are required. Case IV is an example of this:

Mr. D., aged thirty-five years, a farm hand, had a severe fall at work on November 30, 1954, as a result of which he suffered a dislocation of his left shoulder together with a fracture of the surgical neck of the left humerus. He was admitted to hospital on December 1, and open reduction was performed that evening, the fracture of the humerus being reduced and fixed with a Kuntscher nail. The dislocation of his shoulder was then reduced, it being necessary to divide the subscapularis muscle before this could be done. His arm was immobilized in a sling and bound to his side

for three weeks. Shoulder and elbow movements were then instituted. Early in January, 1955, the nail was removed, as it was feared that the projecting upper end would interfere with the rotator cuff mechanism of his shoulder. X-ray films taken in May showed that the fracture had soundly united, but that there was a pronounced deformity of the head of the humerus due to avascular necrosis of the head. At this stage he had a range of 45° of abduction and almost full rotation possible at the gleno-humeral joint.

Though the result in this case is disappointing, it demonstrates a possible method of dealing with a difficult problem (Figures V and VI).

In those cases of fracture of the shaft of the humerus in which open reduction is required, an intramedullary nail may be used and has many of the advantages already described in relation to femoral fractures. Movements of the shoulder and elbow may be commenced at an early stage, and prolonged disability due to joint stiffness thus avoided.

#### The Radius and Ulna.

For the purposes of this paper it is proposed to divide fractures of the radius and ulna into two groups, as follows: (a) fractures of the shafts of these bones; (b) fractures in which the elbow joint is involved.

Fractures of the shaft of the radius and ulna not infrequently require open reduction in order to obtain adequate reduction of the fracture and restoration of



FIGURE VII.

Mrs. E., aged fifty-two years; Monteggia fracture of her right elbow. X-ray films taken six weeks after operation show the position obtained and exuberant callus formation.

function. At the present time this is achieved by plating of one or both bones and plaster immobilization. The results of this procedure are, in general, satisfactory. While fixation of a fracture of the shaft of the ulna with an intramedullary nail presents no difficulties, the introduction of a nail into the radius must be carried out through a window in the cortex of the lower end and is associated with some difficulty. It is thought that intramedullary nailing holds no advantage over plating when dealing with these fractures.

Fractures involving the elbow joint, particularly the increasingly common Monteggia type of fracture in which there is a fracture of the upper end of the ulna with dis-

location of the head of the radius, present a special problem. In the past, results of treatment of this injury have been bad, and it is thought that the use of an intramedullary nail confers advantages allowing early restoration of elbow movement. Case V illustrates this:

Mrs. E., aged fifty-two years, suffered a Monteggia fracture of her right elbow on April 27, 1954. A closed reduction was performed and a satisfactory position obtained, the arm being immobilized in a plaster cast. However, the deformity recurred while the limb was in the plaster cast, and open reduction was performed on May 7. The fracture of the upper end of the ulna was reduced and fixed with a nail, and at the same time the dislocated head of the radius was excised. The arm was immobilized in a plaster cast for



FIGURE VIII.

F., aged thirty-two years. X-ray examination shows a non-united fracture of the mid-shaft of the right femur of eighteen months' duration.

three weeks, and then active movements were commenced. X-ray films taken on June 25 show sound union in the fracture of the ulna, and by the beginning of July, 1954, the patient had regained full movement of her elbow (Figure VII).

Two similar results have since been obtained, and it is contended that it is unlikely that such satisfactory results can be obtained by other methods of treatment.

#### Other Types of Fracture.

So far we have been concerned only with a discussion of the treatment of recent fractures; but a paper such as this would be incomplete without reference to the use of the Kuntscher nail in cases of non-union, compound fractures and pathological fractures.

The established treatment of fractures of the shaft of long bones complicated by non-union has been by the use of a sliding or onlay graft of cortical bone, sometimes with the additional use of cancellous bone chips packed around the fracture site. In suitable cases, after the bone ends have been freshened, an intramedullary nail may be used for reduction and immobilization of the fracture, while cancellous chips are again packed around the fracture site. This method has many of the advantages already described, external support may not be necessary, and mobilization of joints may be instituted at an early stage. Case VI illustrates this:

Mr. F., aged thirty-two years, was admitted to hospital from a country centre on October 17, 1954. He gave the history that he had fractured the shaft of his right femur in May, 1953. He had been treated by traction in a Thomas splint for seven months, and an attempt was then made to insert a Kuntscher nail, but was abandoned for technical reasons. He spent the next ten months with his leg immobilized in a plaster spica.

On examination in October, 1954, he was found to have a transverse fracture of the mid-shaft of his femur, with established non-union and approximately two inches of shortening. Operation was performed on October 18. The fracture site was exposed and about half an inch of sclerotic bone was removed from the end of each fragment. A Kuntscher nail was then inserted, the fracture being immobilized in good position, and bone chips obtained from the iliac crest were packed around the fracture. Convalescence was delayed by a minor wound infection, but the bone was not involved in this process. His wound was completely healed four weeks after operation, and he commenced weight-bearing six weeks after operation. X-ray films taken on January 24, 1955, showed good progress in union, which has since become complete (Figures VIII and IX).



FIGURE IX.

F., aged thirty-two years; the same patient as in Figure VIII. X-ray film taken eight weeks after operation showing good progress in union, which has since become complete.

Though the fracture in this case is now firmly united, the patient still has serious disability due to marked stiffness of his right knee, the result of eighteen months' immobilization and two operations on his femur. Nevertheless, the case illustrates the successful use of the Kuntscher nail in a case of non-union of long standing.

Intramedullary nails have not as yet been used in this country in the immediate treatment of compound fractures. It has already been shown that the Kuntscher nail confers its greatest benefit in fractures of the femur. Compound fractures of the femur are associated with considerable soft-tissue damage, and in a wound of this type the chance of infection is correspondingly great. It would seem that we should aim at achieving healing of the wound by first intention, and a nail should be introduced at a second operation two or three weeks later if the fracture is suit-

able. Little time is lost in this way, and the risk of serious infection is considerably reduced.

Finally, there are some pathological fractures in the treatment of which the Kuntscher nail has been found to have a place. Secondary carcinoma occurring in the shaft of the femur may result in fracture. Immobilization by the use of a Kuntscher nail results in immediate relief of pain and makes nursing and general management considerably easier. It may mean that the unfortunate patient can spend his or her remaining days in relative comfort. Cancer cells may be disseminated; but this is a minor consideration compared with the comfort which results. Solitary bone cysts or *osteitis fibrosa cystica* may be responsible for a pathological fracture. Should this occur in a suitable site, the fracture may be treated by the introduction of a Kuntscher nail, the cyst cavity being curetted and packed with cancellous bone. In these rare cases intramedullary nailing has all the advantages described already, and there are no additional disadvantages. Pathological fractures resulting from Paget's disease usually unite rapidly, and it is seldom that open reduction is required. Should the medullary canal be narrowed by the disease, then nailing may be difficult or even impossible.

#### Results.

This paper is based on a small series of cases, so that a statistical evaluation of results is not possible. There have been 15 cases of fracture of the shaft of the femur, two fractures of the shaft of the humerus, one associated with dislocation of the shoulder, and three Monteggia fractures of the elbow joint. There have also been three cases of non-union, two of the fractures involving the shaft of the femur and one the shaft of the humerus. In all cases union has been achieved. There have been three cases in which convalescence has been delayed by minor wound infection which has responded to appropriate antibiotics, and in no case has there been any spread of infection to the bone. In one case—a fracture of the femur in a patient weighing approximately eight stone—the nail bent when weight-bearing was started. The resultant deformity was easily corrected by manipulation under "Pentothal" anaesthesia, the patient then being provided with an ischial bearing caliper. Restoration of function has in all cases been similar to that already described. All patients with fractures of the femur have commenced weight-bearing approximately three weeks after operation, and with the exception of two have resumed suitable work between eight and ten weeks after operation. One of these two had an associated subdural haematoma and is now undergoing a rehabilitation course. The other is a chronic alcoholic and has not resumed work six months after operation. Union of the fracture in this case has been slow, but now appears to be complete, though there is still some pain at the fracture site. With the exceptions of the case just mentioned and Case VI described above, joint stiffness has not presented a problem, and a good range of movement has been obtained in all cases. These results compare favourably with those reported in literature from overseas.

#### Summary.

1. In this paper there has been a brief summary of the principles underlying all fracture treatment and of some of the difficulties arising from the conventional methods of treatment.

2. The advantages and disadvantages of the use of intramedullary nails in the treatment of fractures of the shaft of long bones have been discussed.

3. It has been shown that the method is applicable to the treatment of a variety of recent fractures, though it finds its greatest application in fractures of the shaft of the femur. It has also been shown that intramedullary nailing can be of use in some cases of non-union and in the treatment of suitable pathological fractures.

4. It has been shown that the method is safe, and that the incidence of complications is low provided that cases are correctly selected and that suitable equipment is available.

5. Finally, it has been shown that the results which can be obtained may confer considerable benefit on both the patient and the community in terms of shortened stay in hospital, earlier return to work and lessened incapacity. These results compare favourably with those obtained elsewhere.

#### Addendum.

Since preparation of this paper there have been five additional cases in which there have been multiple fractures involving one leg. The fracture of the femur was associated with a traumatic below-knee amputation, a compound fracture of the tibia, a comminuted fracture of the patella and, in two cases, multiple fractures of the tarsus. In each case the femoral fracture was treated by the use of a Küntscher nail. As external splinting for the femur is no longer required, management and restoration of function in the injured limb have been considerably simplified.

### POST-OPERATIVE VOLVULUS OCCURRING IN SMALL BOWEL WITH A NORMAL MESENTERY.

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In a series of 39 cases of small bowel volvulus in which the mesentery was normal (Rose, 1955), ten were directly due to an abdominal operation. In seven of these the volvulus involved the ileum and in three the jejunum.

The volvulus followed removal of an acutely inflamed appendix in seven instances (ileal in five, jejunal in two), resection of a gangrenous small bowel intussusception in two (ileal) and a Wertheim's hysterectomy in one (jejunal).

#### Causation.

This series of ten cases may be divided into two groups—group I, in which a predisposing cause was almost certainly present prior to the causal operation, the consequences of the operation acting as an exciting cause, and group II, in which no predisposing cause was present prior to the causal operation, the adhesions following this operation acting as the predisposing cause of the volvulus.

#### Group I.

In group I the predisposing cause was present prior to the causal operation.

There was only one patient in this group. He had a jejunal volvulus following appendicectomy performed through a McBurney incision. Its predisposing cause was a short, tough, apparently congenital band uniting the apex of the involved loop of bowel to the anterior abdominal wall in the left upper abdominal quadrant. In this case the exciting cause was the presence of recent adhesions in the right iliac fossa following removal of a ruptured appendix. They caused recurrent partial ileal obstruction with distension of all the small bowel; this produced the volvulus which occurred thirteen days after removal of the appendix.

#### Group II.

In group II no predisposing causes were present prior to the causal operation, so that the aetiological factor was actually the operation concerned. There were nine patients in this group, seven with an ileal and two with a jejunal volvulus.

In six instances (five ileal and one jejunal) the volvulus followed removal of the appendix at intervals varying from eighteen hours to fifteen years. The predisposing cause in each was the presence of adhesions due both to the inflamed appendix and to the operation for its removal. In the five cases of ileal volvulus the inflamed appendix had ruptured and caused local peritonitis in the right lower abdominal quadrant. In three instances the appendix had been removed through a paramedian incision and the loop of involved bowel was attached to this by adhesions. In

these cases of ileal volvulus there was no apparent exciting cause.

However, in the case of jejunal volvulus an exciting cause was present.

This patient had, as a predisposing cause, numerous, old, firm, generalized abdominal adhesions throughout the peritoneal cavity; these followed an appendicectomy for an acutely inflamed, but not ruptured, appendix situated in the right lower abdominal quadrant, which had been removed through a McBurney's incision some six years previously. The exciting cause was the performance of a subtotal hysterectomy on a uterus the seat of fibromyomata, one of which was so large that its fundus was in the epigastrium. On its removal there was a sudden change in bowel position, presumably with consequent stress on the old already present adhesions, and a jejunal volvulus occurred fourteen days later. At the operation for the volvulus no recent adhesions were found involving the bowel, all being old, thick and firm. The actual adhesion causing the volvulus was one attached by both ends to the posterior abdominal wall, like a bucket handle; through this a loop of jejunum had slipped.

This change in bowel position due to removal of a uterine tumour is a similar mechanism to that causing small-bowel volvulus in a patient with adhesions from some previous abdominal operation, when the parturient uterus suddenly decreases in size as it expels its contents.

In two instances an ileal volvulus was due to adhesions in the right lower abdominal quadrant following small-bowel resection for irreducible intussusception some six years and two years previously, when the patients were aged seven months and twelve years respectively. These adhesions were the predisposing cause and there was no apparent exciting cause.

The third case of jejunal volvulus had, as its predisposing cause, adhesions and a pelvic abscess complicated by an ileal fistula following a Wertheim's hysterectomy performed six weeks previously. The exciting cause was generalized small-bowel distension accentuated by spontaneous closure of the fistula.

#### Symptoms.

Three patients, each with an ileal volvulus, had had similar, though less severe, attacks prior to the one for which operation was performed. Two of these had had one previous attack, six months and two years respectively prior to the present attack. The third had had six attacks in the two years prior to operation.

These attacks are of interest, in that their subsidence was obviously due to the spontaneous untwisting of the volvulus.

In three of the seven patients with an ileal volvulus the last attack commenced slowly in a subacute fashion. The pain waxed and waned, but became increasingly severe during a period varying from twelve to forty-eight hours until the time of operation. As in each instance the bowel was viable at operation, it was obvious that each was only a slowly revolving loose twist. In the other four cases the attack commenced suddenly and violently in an obviously quickly revolving, tight twist. Operation was performed within twelve hours in these instances.

In two of the three patients with a jejunal volvulus there was a partial small intestinal obstruction with colic and distension prior to the onset of the volvulus, which then commenced suddenly with acute colicky pain much more severe than that due to the already existing obstruction. Operation was performed twelve and eighteen hours respectively after the commencement of the actual volvulus. In the third case of jejunal volvulus the attack commenced acutely with no premonitory symptoms.

In the cases of ileal volvulus the pain commenced in the epigastrium and radiated to the right iliac fossa.

In two of the cases of jejunal volvulus the pain commenced in the epigastrium and radiated to the left side of the abdomen, more especially to the left hypochondrium; but in the third, in which a long volvulus stretched across into the right hypochondrium, the pain radiated to that region.

Neurogenic shock, presumably arising from impulses in the twisted mesentery, was to a certain extent present in all cases, but especially in one case of jejunal volvulus. Oligemic shock was present prior to operation in three of the cases of ileal volvulus, and in one of jejunal volvulus. In the last-mentioned, so much blood was lost into the peritoneal cavity in the transudate from the strangulated loop of bowel that an intraperitoneal haemorrhage was closely mimicked. In one other case of jejunal volvulus the shock was most severe after operation and lasted for four days.

In all cases vomiting accompanied the commencement of the attacks; it was probably due to impulses from the twisted mesentery. Vomiting was especially severe and recurrent in cases of jejunal volvulus, as this high intestinal obstruction became more complete. This copious vomiting accentuated the oligemic shock already present.

#### Signs.

Tenderness was present early, and localized to the site of the volvulus as one would expect in such a strangulation-obstruction of the bowel.

In two cases of jejunal volvulus, generalized abdominal distension was present prior to the volvulus, and was, in fact, its exciting cause. In one of these cases, the distension then became more pronounced on the left side of the abdomen over the volvulus.

In all the other cases distension was present early over the site of the volvulus. In fact, in four cases, three of ileal and one of jejunal volvulus, the volvulus could be palpated as a tense, tender cystic mass.

#### Radiographic Findings.

Plain radiographic films of the abdomen were taken in the three cases of jejunal volvulus. In one they showed fluid levels confined to the actual volvulus, the greater part of which crossed the mid-line and was situated in the right hypochondrium. There were also fluid levels in the dilated jejunum in the left hypochondrium proximal to the volvulus. In the other two cases the films showed fluid levels all over the abdomen due to the preexisting small-bowel obstruction.

A plain radiographic examination of the abdomen was made in five of the cases of ileal volvulus. In three cases, in which the films were taken early in the illness, fluid levels were seen in the right lower abdominal quadrant, whereas in the two later cases the levels were more generalized.

#### Diagnosis.

Only one of the six patients examined early in their illness was correctly diagnosed before operation as suffering from a volvulus of the small bowel, the diagnosis in this case being made from the history and physical findings without the help afforded by a palpable cystic tumour. The other five patients of this early group were partially diagnosed correctly as suffering from a strangulation-obstruction of the small bowel.

Of the other four patients examined later in their illness, three were diagnosed correctly on their admission to hospital as suffering from volvulus, because the volvulus could be felt as a localized cystic mass. The fourth was at first thought to have an intraabdominal haemorrhage, so great was the amount of blood-stained transudate from the affected bowel into the peritoneal cavity. The true diagnosis was made when the cystic swelling of the volvulus became palpable.

Thus in five of these ten cases the correct diagnosis was made before operation, whereas in only eight (including these five) of the series of 39 cases of small-bowel volvulus mentioned above was the correct diagnosis made.

#### Findings at Operation.

Apart from adhesions matting loops of bowel together, in all instances except one the apex of the involved loop of bowel was attached by adhesions to some more or less

fixed point—for instance, the abdominal wall scar. In the one exception, a loop of jejunum had slipped under an adhesion fixed by both its ends to the posterior abdominal wall and then twisted into a volvulus.

There was always much free blood-stained fluid in the general peritoneal cavity.

In each instance the volvulus, in length varying from one to three feet, was twisted clockwise. The affected loop of bowel had the usual appearance of a strangulated, though viable, loop of bowel.

#### Treatment.

Fluid and electrolyte replacement therapy was carried out in each instance. Operation consisted of division of adhesions with untwisting of the volvulus only, as in every case the affected bowel appeared to be viable.

#### Mortality.

Two patients died, both with a jejunal volvulus. One death occurred on the sixth post-operative day, from peritonitis due to a tiny leak in bowel thought at operation to be viable. The other patient died not from the volvulus, but from the effects of abdominal sepsis, a pelvis abscess existing before the volvulus occurred.

#### Follow-up Investigation.

Of the eight survivors, all were followed up for periods varying from one to eight years. One had died of a cerebral haemorrhage eighteen months after her volvulus was untwisted. Those remaining were so far well.

#### Summary.

Volvulus of the small bowel with a normal mesentery occurring after abdominal operations is discussed. This is illustrated by ten cases, seven of ileal volvulus and three of jejunal volvulus.

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### THE MANAGEMENT OF RESISTANCE IN PSYCHOTHERAPY.

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PSYCHOTHERAPY is an interpersonal relationship that is controlled by one member with the aim of assisting the other member to achieve relief from symptoms that are relatively distressing.

Resistance is the unconscious opposition displayed toward any attempt to lay bare the unconscious ideas and feelings of a patient. It occurs because this process of laying bare involves liberation into consciousness of unpleasant affects associated with the repressed material. The distress from this recall anticipated by the patient may be greater than the distress suffered from the symptoms. As one patient put it: "It is easier to be sick than to be well."

It is best to approach the problem of management of resistance first from the aspect of manipulating an interpersonal relationship, secondly from the aspect of modifying artificially the mental function of the patient, and thirdly from the aspect of the reactions in the therapist to the manifestations of resistance in his patient.

#### Psychopathology of Resistance.

Let us accept the premise that the mind has forces that operate in diverse ways, and let us consider the psychodynamic implications of resistance, in terms of the Freudian system of psychopathology. Resistance is a

manifestation of repression, the purpose of which is to exclude from consciousness material that produces anxiety.

Reentry into consciousness is influenced by: (i) the libidinal pressure associated with the idea—that is, the intensity of its cathectis; (ii) the degree to which it conflicts with more highly cathected ideas; (iii) the integrity of consciousness—that is, the availability of the counter-cathecting libido; (iv) the capacity of the ego to tolerate disturbing affect.

Orthodox psychoanalysis utilizes the fourth of these factors, but because it is so time-consuming, considerable effort has been made to shorten treatment. This involves acceleration of the working through of resistance, which is done by artificially disturbing the integrity of consciousness. To this end hypnosis has been developed considerably, and there has been much application of the hypnagogic state induced by narcotics, and of the confusion resulting from the effects of anaesthetic gases.

#### Manifestations of Resistance.

The clinical manifestations of resistance will depend on the personality of the patient, because rising anxiety will be alleviated through his habitual defence mechanisms.

1. The patient may chiefly use repression and suppression, the latter meaning conscious and more or less deliberate exclusion of ideas from the psychiatrist; operation of these mechanisms will result in an inability to contribute ideas to the interview, inability to associate ideas, and long silences.

2. Reaction formation is the mechanism that involves very intense repression so that there is conscious preoccupation with ideas and feelings opposite to those underlying the superficial appearances. This may be the mechanism of the defensive flight into health that is sometimes seen.

3. The mechanism of denial may result in the patient's forgetting appointments or being unable to recognize an obvious problem, such as one that would be obvious to a different patient in similar circumstances.

4. Rationalization is a defence that operates through excessive intellectualization that preoccupies the patient and serves to exclude disturbing affect. Clinically it produces lengthy dissertations all around the point. A closely related defence is displacement of attention from ideas associated with much affect, to ideas associated with little affect. Most obsessional patients use both mechanisms, so that in non-directive therapy their dissertations carry them further and further from their real problems. This is one reason for the poor response of these patients to orthodox psychotherapy.

5. Regression means a return to earlier, less mature levels of mental development by a patient who is unable otherwise to alleviate intolerable distress. If this occurs during psychotherapy, there is first a preoccupation with descriptions of childhood events that occurred prior to the main period of stress.

6. Acting-out of repressed impulses refers to the overt expression of unconscious motives in impulsive behaviour. It may occur in symbolic form, or sometimes directly. It may lead to impulsive decisions about major issues not related to the therapy, and may distort relationships with other people. Sometimes acting-out may be attempted during a session of treatment. Most psychiatrists consider that a rigid veto should be placed on socially unacceptable behaviour by the patient during these sessions.

7. Partial breakdown of repression occurs as the patient develops insight. This is associated with increasing anxiety and sometimes with a temporary intensification of symptoms. Many patients use this as a medium through which to vent their aggressive reaction to the hurt that treatment has given them. This is especially likely if hypnosis or drugs are used without the foundation of a sound psychotherapeutic relationship, and often if their use is ill timed.

8. As psychotherapy proceeds, the so-called positive transference situation will usually develop. The patient

experiences an over-valuation of the psychiatrist and cannot proceed beyond his preoccupation with these feelings. This, incidentally, provides the patient with a gratifying fulfilment of his dependency needs. This is a very common manifestation of resistance.

9. Hostility to the psychiatrist is a natural result of interpretation that produces anxiety or guilt. It may be handled by the patient in the following ways: (a) Projection of the hostile attitude to the therapist may occur, and the latter is regarded as a harshly criticizing, inconsiderate person who loses no opportunity to hurt the patient. (b) Aggression may be introverted so that the patient becomes self-devaluating; he feels hopeless and beyond all aid. (c) Aggression may be expressed outwardly in various guises, such as devaluation of the therapy, of the philosophy of the therapy, of normality, of the therapist's personality, of his person, or of his affairs. In less direct expression the patient may take over the interview, and try to exchange roles with the therapist.

I myself have found these outwardly aggressive reactions in patients who have been disappointed that the "cure" they demanded was not promptly given them. My failure to materialize as a supernatural benefactor is felt by the patient as deliberate deprivation and frustration of his demands.

#### Management of Resistance.

From the first session an ever-present objective in psychotherapy is to increase the patient's capacity to tolerate disturbing affect. It begins with the establishment of *rappor*, and continues through the development of a role in which the therapist is friendly, kind, comforting, reassuring and actively helpful, to a stage when the patient has partly identified with the therapist. The reassurance and indirect suggestion that the patient gains from the therapist greatly increase secondary narcissism and the security of the patient. Hence the rapid initial improvement when the patient first comes under treatment; hence the gradual reappearance of repressed hurtful memories. Therefore the first step in handling resistance is to increase this process. It may almost be that the therapist functions as an "auxiliary ego" for his patient.

The next step is to understand how the patient is resisting, how he is reacting to increasing anxiety.

Then the patient is gently led into realization that he is not talking about things that are worrying him, or that maybe he is not talking or not associating because he is afraid to talk. It is essential that the patient be emotionally reassured by really feeling that the therapist is not emotionally affected by what he might say or do. This needs to be more than the empty statement "I have heard it all before". I sometimes tell the patient that the emotion associated with his early memories seems overwhelming, because while it is repressed he reacts to it as he did when the emotion was first aroused. I then add emphatically that as he recalls the difficulty he will react to it in the light of subsequent experience and of his present situation.

The final step is to make partial or trial interpretations. This may be in the form of gentle hints, or of half sentences. Often an amorphous comment like "Could it be that, er —" will be followed by insight and recall.

Partial interpretations must be made in a way that helps the patient to express his anxiety or guilt.

Transference resistances are best handled by prophylaxis by non-analysts. However, superficial therapy can often be quite successful, so it is worthwhile to persist even if transference develops. Some say that it always does. If the patient shows that he needs the therapist to play a particular role, then it can be useful to play the opposite role and then work through the patient's reaction to the situation that develops.

Many patients are helped by the therapist leading them into understanding how their interpersonal relationships are influenced by their intrafamily relationships, at least as far back as puberty. It is not necessarily wrong for a non-analyst to work through a patient's development to this level at least. Most psychiatrists do so regularly.

#### Persistent Resistance.

It is only at this stage, after maximum support and reassurance, after maximum permissible leading, and after partial interpretation, that the techniques that interfere with consciousness should be considered.

They should be applied only when the patient is secure in his attempt to achieve full insight, when it is felt by the therapist that the patient's ego can tolerate any anxiety or guilt that may eventuate, and when the patient fully understands what the therapist is going to do.

The following types of technique are available: (i) hypnosis; (ii) narcotics injected intravenously; (iii) anaesthetic gases; (iv) amphetamines administered intravenously.

#### Hypnosis.

Hypnosis is regarded as the method of election, because the situation can be largely controlled. Should really intolerable memories be recalled (which is rare, but serious when it happens), they can be completely repressed again by post-hypnotic suggestion. One such re-representation concerned the death of a friend of the patient, and has lasted for five years so far. Under hypnosis affect can be split from ideas; this allows the facts to be recalled first without affect, which can be released later and in gradual tolerable amounts.

Under hypnosis, techniques can be used that eliminate the use of words. These give such direct access to the deep unconscious that one wonders whether many of the secondary defence mechanisms depend on verbalization of thought. They certainly develop at the time when speech is developing. Meares's technique of drawing phantasy, and a technique of visual image association, can save much time and, more important, completely eliminate the use of interpretation. The technique allows the patient to read his own mind. I do not try to do it for him. It is considered that this, in addition to overcoming much resistance, also overcomes the orthodox scientific criticism that analytic-type treatment involves interpretation and inescapable suggestion.

#### Narcotics Injected Intravenously.

"Pentothal Sodium" or "Sodium Amytal" given intravenously very slowly sometimes produces a hypnagogic state with a definite disturbance of consciousness. In traumatic disturbances of recent origin, the revivification and abreaction may be spontaneous. In more chronic cases the therapist must use the hypnagogic state as a means to broaden the range of association that the relaxation of tension and affect allows. It is possible to use the technique of visual image association with narcotics. However, the situation is more difficult to control than with hypnosis.

#### Anaesthetic Gases.

Ether and carbon dioxide, nitrous oxide and "Trilene" have been used. The technique is to administer a plane II anaesthetic very badly from the surgical point of view. The patient may be led into dissociation by discussing events prior to the traumatic period. These dissociations are often associated with violent abreaction and very real distress afterwards. The disadvantages of this method are that the situation cannot be controlled except by physical restraint, and that occasional cases of confusional psychosis lasting more than a week may occur after ether abreaction.

#### Amphetamines Administered Intravenously.

"Methedrine" (15 to 30 milligrammes) produces a greatly increased rate of ideation, which often overcomes resistance. It is especially useful in the treatment of the inhibited patient who cannot associate freely—the type of patient who goes to sleep after a minute amount of "Pentothal".

"Methedrine" given intravenously is dangerous. In one case a definite (fortunately not fatal) subarachnoid haemorrhage occurred fifteen minutes after it was given; several cases of peripheral neuritis occurred in neurotic alcoholics who were given several "Methedrine" treatments at inter-

vals of about two weeks. At the psychiatric level, it is said to be dangerous if the patient has latent schizophrenia.

#### The Psychiatrist's Reactions to Resistance.

It has been assumed in this discussion that the therapist is fully secure and satisfied in his own life situation, so that he can listen to the patient without reacting in accordance with his own problems.

When resistance occurs in the patient, it necessarily threatens the security of the psychiatrist, because it portends failure on his part. His reactions to this may be varied. He may seek to hide his insecurity behind professional pomposity, he may inflict his interpretations on the patient regardless of the real needs, he may insist on the patient's doing and accomplishing things before he is ready. He may allow the therapeutic situation to change from one of collaborative guidance to irrational authority. He may become resentful or even anxious, and may even confess minor errors to the patient, asking indirectly his forgiveness. Such insecure reactions as these are not as rare as they may seem, and are most in evidence when the patient is expressing hostility.

Now it is obvious that insecure reactions like these can only increase the resistance of the patient and may lead to the abandonment of therapy on the rationalization that the patient is untreatable. At the moment the fashionable criterion of untreatability is "immaturity" or "inadequacy". A few years ago it was "psychopathic personality".

#### Summary and Conclusions.

In summary it may be said that the management of resistance is the management of an interpersonal relationship between patient and therapist. Both act and react in relation to each other. The essential factors on both sides are rising tension and anxiety, increasing insecurity, and defensive reactions.

The principle in management is genuine understanding of what is happening and collaboration to produce security to allow insight to develop.

In conclusion, it is emphasized that hypnosis and the other "artificial" methods should be used only on the basis of a sound psychotherapy.

#### INVESTIGATION OF A STAPHYLOCOCCAL EPIDEMIC IN BABIES IN A MATERNITY HOSPITAL, AND SIMILAR OUTBREAKS IN OTHER HOSPITALS.

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THE following is an account of the investigation and management of an outbreak of haemolytic staphylococcal infections in the Queen Victoria Maternity Hospital, Adelaide. The bacteriological studies were carried out at the Institute of Medical and Veterinary Science and the bacteriology department of the University of Adelaide.

Many articles on the problem of staphylococcal infections have recently appeared in the journals, emphasizing the importance and widespread nature of these organisms in hospital practice (Colbeck, 1949; Rountree and Barbour, 1950; Coventry and Isbister, 1951; Isbister, 1951; Felsen, 1951; Rountree and Thomson, 1952; Isbister *et al.*, 1954; Webb, 1954).

In describing the clinical side of this particular outbreak, therefore, there is no need to point out the practical significance of such episodes with their attendant dangers.

However, it is thought that some stress should be placed upon the following points in relation to these situations: (i) the necessity for close cooperation between the clinical and bacteriological workers; (ii) the failure of antibiotics alone to control the spread of the organism; (iii) the need for putting into operation strict methods of isolation, asepsis and antisepsis.

#### Clinical Aspects.

The onset of this epidemic was not sudden and dramatic, but rather insidious and slow; the epidemic gained momentum until it reached serious proportions. From the records it appears that the organism was active for several weeks without causing any alarm. Sporadic cases had been observed in October and early November, 1953, and were recorded as skin pustules, mainly localized in distribution. At this stage no bacteriological investigations were requested, which indicates the mildness of the lesions and the lack of anxiety concerning them. It is not possible to determine when the first case occurred, but the initial lesion from which staphylococci were isolated was in Baby L. (B4518); this was on November 21, 1953. A culture of pus from paronychia in this case produced a growth of a staphylococcus, sensitive to streptomycin and "Terramycin", weakly sensitive to "Aureomycin" and "Chloromycin", and insensitive to penicillin. This culture was reported from the hospital laboratory, and further investigations were carried out in the Institute and University laboratories.

After this, cases became daily more prevalent, the lesions consisting of skin pustules, paronychia, conjunctivitis, cellulitis and abscesses. On December 23 a case of maternal mastitis was observed. On this date Mrs. D. (B5852) was readmitted to hospital with a breast abscess. A culture was prepared from the pus evacuated and produced a moderate growth of a non-haemolytic staphylococcus (coagulase-positive), sensitive to "Aureomycin", streptomycin, "Chloromycin", "Terramycin" and "Erythrocin", and insensitive to penicillin.

By January, 1954, the epidemic was well established and showed no signs of abating, and no mother or baby seemed immune from attack. Space does not permit a detailed account of the clinical course; but a further activity of the organism must be noted before we deal with the therapeutic and prophylactic measures taken. By late February, cases of staphylococcal infection were observed among the staff handling the babies in the nursery. By the end of March the staff was continually depleted by nurses being sent off duty with various purulent skin lesions, situated mainly on the hands and forearms. From a culture from these lesions we may quote the reports on Nurse M. and Nurse B. (both made on March 2, 1954). Both cultures produced a moderate growth of a haemolytic staphylococcus (coagulase-positive). By now the clinical pattern was well established, and it would appear that the chain of infection was as shown diagrammatically in Figure I. It was apparent also that, whilst chemotherapy (and any necessary surgery) would cure the individual with a manifest lesion, it did not prevent dissemination of the disease, and the problem was where to attack and disrupt the foregoing cycle.

#### Control of Spread.

In February the Director and the Medical Bacteriologist at the Institute of Medical and Veterinary Science were consulted, and after their inspection of the hospital certain steps were taken and a strict routine was instituted. In brief, their recommendations can be summarized as follows from a letter received after the visit:

1. The main source of infection is no doubt due to nasopharynx carriers. Therefore, the whole staff should have nose and throat swabs taken. Any coagulase-positive staphylococci should be phage-typed to determine what strains are involved. Any members found to be carriers should be withdrawn from contacts with infants.

2. Isolation of infants and members of staff with active lesions. [This was being done as far as possible.] Eliminate overcrowding of the nurseries and wider spacing of basinettes. [This was almost an impossibility.] Use of the

antiseptic formula provided rather than mercurochrome and "Dettol".

3. Elimination of mosquito nets as a source of contact between babies, and improved fly-proofing of the nurseries.

The final clause in these recommendations carried the warning that "the cases do not appear to have been serious . . . It should be borne in mind, however, that some change in conditions might result in a marked increase in rate of spread and virulence".

The foregoing measures were put into operation with vigour, and no fatal case occurred, although the stay in hospital for many babies was greatly prolonged. Fortunately, there was no infection in the labour ward.

At the height of the epidemic several babies constituted a source of worry and concern. There were also two babies who were diagnosed as suffering from septicæmia (one after an exchange transfusion), the causative organism being, presumably, the staphylococcus, although this was never isolated.

One of the side effects of this particular outbreak was the cessation of circumcision on male babies, previously performed at the request of the mother.

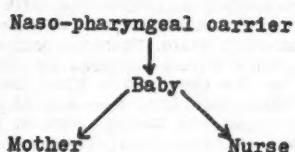


FIGURE I.

#### Treatment of Patients.

Apart from evacuation of pus and other local measures applied to established lesions, the main therapy consisted of the oral administration of "Terramycin" and "Chloromycin" to infants, and the intramuscular administration of "Terramycin" to adults. It was early established that penicillin was useless, and antibiotic sensitivity tests confirmed this. For resistant lesions and in the treatment of very sick babies "Erythrocin" was used.

#### Further Measures.

Another step taken at a later date after further bacteriological investigation was the routine cleaning of articles such as nursery scales and ointment jars with "Sudol", in a strength of about 1:80. More recently we have instituted the use of "Gamophen" soap in all parts of the hospital because of encouraging reports from Sydney and Perth.

After the foregoing measures were put into effect, the epidemic ceased.

#### Bacteriological Investigations.

The field work and isolation of staphylococci were carried out by one of us (J.E.McC.) and the phage typing by Miss Sibely J. McLean, lecturer in bacteriology at the University of Adelaide. Valuable technical assistance was given by Mr. L. R. Rowett, senior technician at the Institute. Technical details of phage typing are given by McLean in the accompanying paper (McLean, 1956).

The first part of this section will deal with swabs from Queen Victoria Maternity Hospital, and the results from other hospitals will be given later.

Staphylococci were obtained from the pustular lesions in the babies and mothers to ascertain the phage pattern of the infecting strains. Antibiotic sensitivity tests with the use of disks impregnated with penicillin, "Aureomycin", streptomycin, "Chloromycin", "Terramycin" and "Erythrocin" were also made. Staphylococci were obtained from mastitis lesions in two nursing mothers.

Swabs were taken from both nostrils and the throat of members of the hospital staff connected with the wards

concerned. These were plated out on 10% horse-blood agar plates and incubated at 37° C. overnight. The growths of staphylococci were assessed as scanty, moderate or heavy. Colonies were picked off and examined by the coagulase test, and coagulase-positive organisms were phage typed. Antibiotic sensitivity tests were carried out on these for comparison with the infecting strains.

Swabs were also taken from articles in the maternity wards and annexes, such as bedsteads, scales, basins, taps, lotion bottles, door handles *et cetera*. These were plated out on blood agar and examined as above.

#### Results.

Material from pustules from 11 babies and from an infected eye in one baby was examined. In all, coagulase-positive staphylococci were present, sensitive to "Aureomycin", streptomycin, "Chloromycetin", "Terramycin" and "Erythrocin", and insensitive to penicillin.

The staphylococci from the 11 babies with pustules all gave the same phage pattern—namely, 7/42E/73W—and this type was deemed to be the infecting strain.

Staphylococci from the eye lesion were untypable.

Staphylococci were isolated from right and left breast abscesses of one mother and from the milk of another. These organisms gave sensitivity tests and phage patterns similar to the infecting strain. Staphylococci were isolated from lesions on three nurses—namely, an abscess on the arm, a pustule on the face, and a small abscess on the right forearm. These organisms were also of the infecting phage type. The nasal and throat swabs of these nurses failed to yield any coagulase-positive staphylococci.

Swabs were taken from both nostrils and the throat of 159 members of the staff; staphylococci were found in 45 persons and no staphylococci were isolated from 114 persons. Of the 40 nasal swabs that gave positive results, 11 yielded a heavy growth of staphylococci from one or both nostrils, nine yielded a moderate growth and 20 yielded a scanty growth. Of the throat swabs, none yielded a heavy growth of coagulase-positive staphylococci, three yielded a moderate growth, seven yielded a scanty growth, and 39 yielded no growth.

In only five cases were staphylococci isolated from throat swabs and not from nasal swabs, and in none of these was the growth heavy.

Of the nasal swabs, heavy growths were obtained from both nostrils in three cases, and from one nostril only in eight cases. Of the remainder, moderate or scanty growths of staphylococci were obtained from one only of the nasal swabs in five cases.

These results indicate the importance of taking swabs from both nostrils.

Five nurses were found to be nasal carriers of the epidemic phage type of staphylococcus. No purely throat carrier of the epidemic phage type was found.

Swabs were taken from 18 articles in the wards. The swabs were moistened with sterile water and well rubbed over the objects examined. The water supply of two of the wards was examined and found sterile. The articles from which swabs were taken comprised scrubbing brushes, basins, scales, crib, blankets, basin and bath taps, changing table, hand-lotion bottles, baby oil, handles on doors, drawers and cupboards, brushes, combs *et cetera*. Coagulase-positive staphylococci were isolated from seven articles; two of these—one of the nursery scales and a hand-lotion bottle—yielded staphylococci of the epidemic phage type.

#### Other Hospitals.

Concurrently with the epidemic at Queen Victoria Maternity Hospital, cases of staphylococcal infection in young children were being reported from other hospitals in Adelaide and in other parts of the State.

A general hospital ("CA") with a large maternity block was investigated. The cases followed clinically and epidemiologically the outbreak at Queen Victoria Maternity Hospital.

Cultures were taken from the pustular lesions, and nose and throat swabs were obtained from the nursing staff in the maternity block. These were investigated as previously described.

In this hospital the infecting strains of staphylococci showed a phage pattern differing somewhat from the main epidemic type. They gave weak reactions with phages 42E and 73 and were not lysed by phages 52 or 52A, whereas strains from Queen Victoria Maternity Hospital and other hospitals were lysed by a combination of phages 7, 42E, 52, 52A and 73. This same phage pattern was also found in three of the nursing staff, and one of them—a sister in the maternity block—had a heavy throat infection. She was relieved from duty and the outbreak ceased. Two days after her return to the wards staphylococcal infections were again noted in babies; the type was the same as previously, and was again isolated from the sister.

Swabs were also taken from various articles in the maternity block, and coagulase-positive staphylococci were isolated from the nursing tray, dressing tray, demonstration bath and gown basket. None of these gave the infecting phage pattern.

After this typing had been carried out, phage 80 was received from Dr. P. M. Rountree (McLean, 1956). The strains of staphylococci were reinvestigated with this phage, and it was found that none of the strains from "CA" hospital were lysed even with the undiluted phage. These results are of great interest, and they indicate that the infection was an endogenous one, arising directly from the nursing staff.

Measures along the lines previously mentioned were instituted, and no further cases were reported for about three months, when four babies showed pustular lesions. Of these, the "CA" hospital epidemic type was present in three and not in the fourth. Examination of swabs from the maternity staff showed that two harboured this infecting phage pattern of staphylococcus, and these were presumably responsible for this small outbreak.

Staphylococcal infections were reported from a small babies' hospital ("MA"). Investigations showed that the phage pattern of staphylococci isolated from the babies there was the same as the epidemic pattern found at Queen Victoria Maternity Hospital. As babies were sent from this latter hospital to "MA" hospital, it is presumed that the infection was directly transmitted.

Swabs were taken from the whole staff (throat and both nostrils), and two carriers of the epidemic type of staphylococcus were found. In addition, swabs were taken from various articles in the nurseries. Although several of these yielded coagulase-positive staphylococci, only one—baby scales—yielded the epidemic type. Preventive measures were instituted.

Other hospitals in Adelaide and in the south-east of the State reported staphylococcal infections in babies. Investigation showed that the causative organisms were of the main epidemic phage pattern.

#### Summary.

An investigation of staphylococcal infection in babies in a large maternity hospital, and in other hospitals, has been carried out. The epidemic phage type is 7/42E/73W, and is identical with Rountree type 80, which has been found in Sydney and in hospitals in other States.

One hospital had a small outbreak due to an entirely different phage type, arising from a throat carrier, one of the nursing staff.

The main outbreak is described, and the methods for dealing with it are given.

The value of phage typing in staphylococcal epidemics of this nature is emphasized.

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### BACTERIOPHAGE TYPING OF STRAINS OF *STAPHYLOCOCCUS AUREUS* IN SOUTH AUSTRALIA.

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In the last few years bacteriophage typing of strains of *Staphylococcus aureus* has proved of considerable value in the investigation of outbreaks of staphylococcal infections.

Fisk (1942a, b) reported that phages carried by staphylococci exhibited selective activity when tested on strains of *Staph. aureus*. Strains isolated from related sources reacted with the same phages and could be differentiated from other strains by this method. Further work by Fisk and Mordvin (1944) confirmed this observation. Wilson and Atkinson (1945) extended Fisk's technique and developed a routine method for the identification of strains of *Staph. aureus*.

In 1946 a routine service of bacteriophage typing of strains of *Staph. aureus* isolated in epidemiological investigations was set up for the Public Health Laboratory Service in its Central Laboratories at Colindale, London, with the use of the methods and phages of Wilson and Atkinson. Williams and Rippon (1952) from this laboratory described in detail the methods for propagation of staphylococcal phages and for their use in identifying strains of staphylococci, and these methods have been adopted in many laboratories. Williams, Rippon and Dowsett (1953) made the following statement:

The phages in use at present give pattern reactions rather than truly type-specific reactions; that is, one staphylococcus may be lysed by several different phages, and each of these phages may enter into a number of different patterns on different strains. In practice therefore, the results of typing are reported as a bacteriophage pattern.

In Australia identification of strains of *Staph. aureus* by phage typing has been carried out in Sydney for a number of years by Rountree and her associates (Rountree and Thomson, 1949; Rountree and Barbour, 1950; Rountree, 1953; Isbister, Durie, Rountree and Freeman, 1954).

This paper describes the routine methods of bacteriophage typing which have been adopted in Adelaide and gives the phage patterns obtained in several outbreaks of staphylococcal infections.

#### Methods.

As far as possible the methods of Williams and Rippon (1952) have been followed. Nutrient broth was used for fluid cultures and Hartley digest broth with 1% Kobe agar for propagating and for typing. Dried cultures of

the bacteriophages and their propagating strains were obtained from the National Collection of Type Cultures, London. The dried phages were resuspended in a small volume of nutrient broth and propagated on the surface of plates four inches in diameter containing 1% agar. These plates were frozen at -20° C. and allowed to thaw, and the fluid was titrated on the propagating strain to determine the routine test dilution, the highest dilution at which the phage gave confluent lysis. The phage was then propagated on large plates (8.5 inches in diameter) at a dilution slightly stronger than the routine test dilution. The fluid obtained from freezing and thawing these plates was filtered through a Seitz filter, titrated to determine the routine test dilution, and tested for sterility. This was the final phage preparation and was stored at 4° C.

Williams and Rippon (1952) found that the typing phages had a characteristic lytic spectrum on the set of propagating strains. Each new batch of phage was therefore tested to see that it retained the usual spectrum. The phage was spotted, undiluted, on the set of propagating strains, then titrated on any strains which were lysed. The

TABLE I.  
Routine Test Dilutions of the Phages.

Phage.	Routine Test Dilution.	Phage.	Routine Test Dilution.
3A	1/100	70	1/500
3B	1/1,000	73	1/500
3C	1/10,000	75	1/500
6	1/1,000	76	1/100
7	1/100	77	1/10,000
29	1/1,000	29A	1/500
42D	1/50	31A	1/100
42E	1/1,000	42B	1/100
44	1/100	42C	1/100
47	1/1,000	44A	1/50
52	1/100	47A	1/500
52A	1/1,000	47B	1/10,000
53	1/1,000	47C	1/10
54	1/1,000	51	1/1,000
55	1/1,000		

phage titre on any one strain should remain in practically constant ratio to that on the propagating strain.

Phage typing of unknown strains of staphylococci was carried out according to the method of Williams and Rippon, except that the plates were not underlayered with peptone water agar. A basic set of 20 phages was used at first: 3A, 3B, 3C, 6, 7, 29, 42D, 42E, 44, 47, 52A, 53, 54, 55, 70, 73, 75, 76 and 77. If no reaction was obtained with these phages at the routine test dilution the strain was tested with undiluted phages. If no lysis was obtained with these undiluted phages, a further set of phages, 29A, 31A, 42B, 42C, 44A, 47A, 47B, 47C and 51, was used undiluted.

The results were recorded as follows: "+" more than 50 plaques; "+", 20 to 50 plaques; "±", less than 20 plaques.

The phage patterns reported were a list of the numbers of the phages that gave "+" lysis followed by "±" if there were additional minor reactions. If no phages gave "+" lysis, the numbers of phages giving "+" or "±" reactions were reported followed by "w" to denote that the reactions were weak.

Two hundred and sixty-two strains of coagulase-positive staphylococci were investigated. Fifty-seven strains from infections in a children's hospital (CH) were typed first to see whether the methods were satisfactory; then phage-typing was carried out on 92 strains from an outbreak of staphylococcal infection in a maternity hospital (QV). Strains from similar outbreaks of infection were investigated from hospitals MG, MA and CA. The methods used for the collection of nasal and throat swabs to detect carriers in these hospitals are given in an accompanying paper by McCartney and Yates (1956).

TABLE IIIA.  
*Lytic Spectra of the Bacteriophages on the Propagating Strains of *Staphylococci*.*

Propagating Strain.		Phage Number. <sup>1</sup>																										
Number.	Used for Phage.	3A	3B	3C	55	53	51	29	52	31A	44A	44	29A	42C	42B	47C	47B	73	7	70	47	54	76	77	42E	6	42D	47A
234	3A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
211	3B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1839	3C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
H/31508	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
145	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
33	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
144	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
025	52A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R48/2320	31A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
373	44A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1351	29A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1807	42C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1163	42B/47C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
087	47B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F56-A	78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H/42	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R48/3303	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H/6415	75/76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H/84	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1670	42E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R48/3292	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1363	42D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
761	47A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

<sup>1</sup> The following notation is used: - = no lysis; 5 = maximum titre; 4 = 1/10-1/10<sup>4</sup>; 3 = 1/10<sup>2</sup>-1/10<sup>3</sup>; 2 = 1/10<sup>8</sup> or more of maximum titre.

### Results.

The titres of the phages after propagation are given in Table I. Phages with titres lower than one in 1000 were propagated again, but were mostly found not to improve.

TABLE IIIB.  
*Differences between Lytic Spectra in Table IIIA and those of Williams and Rippon.<sup>1</sup>*

Phage Number.	Strain Number.	Reaction in Lytic Spectrum.	Reaction in Lytic Spectrum of Williams and Rippon (1952).	Reaction in Lytic Spectrum of Rippon (1953).
51	211	-	+(3)	+(3)
51	1851	+(5)	-	-
52	4	+(2)	-	-
52A	4	+(3)	-	-
52A	36	+(2)	-	-
29A	4	-	+(3)	+(4)
42C	1351	-	+(3)	+(4)
42B	R48/3292	+(3)	-	-
47C	284	+(2)	-	-
47C	1339	-	+(2)	-
47C	373	-	+(2)	+(4)
7	18	-	+(3)	+(3)
47	R48/3303	+(2)	+(5)	+(5)
47	1363	+(5)	-	-
53	1670	-	+(3)	+(2)
53	R48/3292	+(5)	+(3)	+(2)
53	1363	+(2)	-(3)	-
47A	1339	+(4)	-	-
47A	1351	+(3)	-	-
70	R48/3303	-	0	+(3)
70	R48/3292	-	0	+(3)
73	3	-	0	+(3)
73	R48/3303	-	0	+(4)
73	R48/3292	+(4)	0	-
76	1363	-	0	+(2)
77	R48/3303	+(2)	0	+(5)

<sup>1</sup> The following notation is used: "0" = lytic spectrum of those phages not recorded; "—" = no lysis; "+" = lysis; figures in parentheses represent relative titres of the phages as in Table IIIA.

The lytic spectra of the phages are set out in Table IIIA. These differed slightly from the spectra given by Williams and Rippon (1952), and by Rippon (1953), and these differences are given in Table IIIB. The variations could be due to the media used, and could cause minor differences in the phage patterns compared with those of Williams and Rippon. Inhibitory effects were noticed when several of the phages were used undiluted.

The number of strains typed with the basic set of phages diluted to the routine test dilution, undiluted, and with the extra set of phages undiluted, is given in Table III. Among 57 strains from hospital CH, 12 were typed with diluted phages, 43 with undiluted phages and one with the extra set of phages, and one strain could not be typed. In hospital MG one out of five strains was untypable, while the remaining four strains were typed with undiluted phages. In hospital QV 92 strains were investigated; 57 of these were typed with diluted phages, 25 with undiluted phages and four with the extra set of phages. Six strains were untypable. Among 71 strains from hospital MA, 44 were typed with diluted phages, 12 with undiluted phages and two with the extra phages, while 13 were untypable. In hospital CA 26 out of 37 strains were typed with diluted phages and six with undiluted phages, while five were untypable.

The phage patterns obtained were divided into groups according to the scheme of Williams, Rippon and Dowsett (1953), as follows:

Group I: 52, 52A, 29, 29A, 31A, 44, 44A.

Group II: 3A, 3B, 3C, 51, 55.

Group III: 6, 7, 42B, 42D, 42E, 47, 47B, 47C, 53, 54, 70, 73, 75, 76, 77.

Unclassified: 42C, 47A, or combinations of Group I and

Group III or Group II and Group III phages.

Table IV gives the distribution of the typable strains in these groups.

The distribution of phage groups among strains from the patients in hospital CH is given in Table VA. Tables VB, VC and VD record the distribution of phage groups among strains from carriers and patients in hospitals QV, MA and CA. Strains belonging to phage group III were predominant in four hospitals, being 70.2% of the strains in hospital CH, 51.0% in hospital QV, 46.5% in hospital MA and 70.3% in hospital CA. In hospitals QV and MA there were a large number of strains in the unclassified group (28.3% and 25.4% respectively) having phage patterns which were combinations of group I and group III or group II and group III. In hospital CA there were more group I strains than in the other hospitals. Hospital QV had a higher percentage of group II strains than the other hospitals, the most common group II phage patterns in this hospital being 3A/3B/3C/55.

TABLE III.

Comparison of the Number of Strains of *Staphylococci* Typed with the Basic Set of Phages Diluted to the Routine Test Dilutions, Undiluted, and with the Extra Set of Phages Undiluted.

Hospital.	Total Number of Strains.	Number of Strains Typed with Diluted Phage (R.T.D.). <sup>1</sup>	Number of Strains Typed with Undiluted Phage.	Number of Strains Typed with Extra Set of Phages Undiluted.	Number of Non-typable Strains.
CH (a children's hospital) . . .	57	12 (21.1)	43 (75.5)	1 (1.7)	1 (1.7)
MG (maternity section) . . .	5	0	4 (80.0)	0	1 (20.0)
QV (a maternity hospital) . . .	92	57 (62.0)	25 (27.2)	4 (4.3)	6 (6.5)
MA (a babies' hospital) . . .	71	44 (62.0)	12 (16.9)	2 (2.8)	13 (18.3)
CA (maternity section) . . .	37	26 (70.3)	6 (16.2)	0	5 (13.5)
Total . . . . .	262	189 (53.0)	90 (34.4)	7 (2.7)	26 (9.9)

<sup>1</sup> R.T.D. = routine test dilution. Figures in parentheses are percentages.

TABLE IV.

Distribution of Strains of *Staphylococci* in the Different Phage Groups.<sup>1</sup>

Hospital.	Number of Strains Tested.	Group I.	Group II.	Group III.	Unclassified.	Non-typable.
CH	57	3 (5.3)	3 (5.3)	40 (70.2)	10 (17.5)	1 (1.7)
MG	5	0	0	0	4 (80.0)	1 (20.0)
QV	92	2 (2.2)	11 (12.0)	47 (51.0)	20 (22.3)	6 (6.5)
MA	71	4 (5.6)	3 (4.2)	33 (46.5)	18 (25.4)	13 (18.3)
CA	37	4 (10.8)	0	26 (70.3)	2 (5.4)	5 (13.5)
Total . . .	262	18 (5.0)	17 (6.5)	146 (55.7)	60 (22.9)	26 (9.9)

<sup>1</sup> Figures in parentheses are percentages.

TABLE VA.

Hospital CH: Distribution of Phage Groups among Strains of *Staphylococci* from Patients.

Phage Groups.	Strains of Coagulase-Positive <i>Staphylococci</i> from						No Record of Source: Number of Strains.	Total.		
	Pus.		Faeces.		Urine.					
	Number of Strains.	Phage Patterns. <sup>1</sup>	Number of Strains.	Phage Patterns. <sup>1</sup>	Number of Strains.	Phage Patterns. <sup>1</sup>				
Group I . . . . .	3	29 52+	0		0			3		
Group II . . . . .	3	3B/3C/55 7/42E/73+	0		0			3		
Group III . . . . .	23	7/47/54/77+ 7/47/53/54/73/75/76/77 6/42E/47/52/52A/64+ 29/53/54/75/76/77 7/55 7/42E/52/52A/73w	16	7/47/54/77+ 6/7/47/54/77+	1	7/47/54/77		40		
Unclassified . . . . .	5		5	7/29/52/52A+ 29/53/54/73/76+ 7/29/52/54/73+ 7/42E/52/52A/73w 3C/7/42E/47/53/54/75/76/77				10		
Non-typable . . . . .	0		0		0		1	1		
Total . . . . .	34		21		1		1	57		

<sup>1</sup> Examples of some of the more commonly occurring phage patterns.

In hospital CH there were several very common phage patterns, 7/42E/73+, 7/47/54/77+ and 6/7/47/54/77+.

During the search for nasal carriers in the hospitals, swabs were taken from both nostrils, and in most cases, as would be expected, these pairs of strains had identical phage patterns—for example:

Subject 9: Right nasal swab, 6/47/54+  
Left nasal swab, 6/47/54+  
Throat swab, 6/47/54+

Subject 3: Right nasal swab, 7/42E/47/54/75/76+  
Left nasal swab, 7/42E/47/54/75/76+

In one outbreak some strains from the pairs of nasal swabs were typed on different days and gave identical patterns, as follows:

Subject 391: Right nasal swab, 29/53/54/75/76/77.  
(25/2/54)

Subject 392: Left nasal swab, 29/53/54/75/76/77.  
(26/2/54)

Subject 246: Right nasal swab, 29/42E/47/52/54/70/73+  
(24/2/54)

Subject 247: Left nasal swab, 29/42E/47/52/54/73+  
(25/2/54)

These results indicated that the general typing technique was satisfactory.

Among the staphylococci investigated from hospital QV were a number of strains characterized by the weak pattern 7/42E/73. This pattern was given by staphylococci from the first infected babies tested and from several nasal swabs from members of the staff. When the phages were used at the routine test dilution, the reactions were of the "+" or "±" degree. Some strains gave no reaction with diluted phages, but when undiluted phages were used they gave a similar pattern, sometimes including weak reactions

TABLE VB.  
Hospital QV: Distribution of Phage Groups among Strains of Staphylococci from Carriers and Patients.

Phage Groups.	Strains of Coagulase-Positive Staphylococci from						Total.	
	Nasal Swabs.			Throat Swabs.		Material from Lesions.		
	Number of Strains.	Phage Patterns. <sup>1</sup>		Number of Strains.	Phage Patterns. <sup>1</sup>			
Group I ...	2	52Aw		0		0	2	
Group II ...	9	29/44/52/52A 3A/3B/3C+ 3B/3C/55		2	3A/3B/3C+ 3B/3C/55	0	11	
Group III ...	32	7/42E/73w 6/7/47/54 7/64/76/77		5	7/47/53/54 6/7/42E/47/54/75+ 7/47/53/54/70/76/77+	10	47	
Unclassified ...	17	3A/3C/42E/53/54+ 6/42E/44/47/53/54/70/75/76/77 44/42E/47/52/54/70/73+ 47A+		1	7/29	8	26	
Non-typable ...	4			1		1	6	
Total ...	64			9		19	92	

<sup>1</sup> Examples of the more commonly occurring phage patterns.

TABLE VC.  
Hospital MA: Distribution of Phage Groups among Strains of Staphylococci from Carriers and Patients.

Phage Group.	Strains of Coagulase-Positive Staphylococci from						Total.	
	Nasal Swabs.			Throat Swabs.		Material from Lesions.		
	Number of Strains.	Phage Patterns. <sup>1</sup>		Number of Strains.	Phage Patterns. <sup>1</sup>			
Group I ...	2	52A+		1	52Aw	1	44/52A	
Group II ...	3	52/52A 3C/55		0		0	3	
Group III ...	23	3B/3C/55 7/42E/47/54/73/75/76+ 6/47/54+ 53/76/77+ 42B		4	7/42E/47/54/75+ 6/47 42E/47/54/73/75/77+	6	7/47/54/55/77 47+ 7/42E/73w	
Unclassified ...	15	7/42E/44/52/52A/54 42E/52/52A/73w 29/77		0		3	52/52A/73w 42E/52/52A/73	
Non-typable ...	7	6/7/42E/44/52A/54		1		5		
Total ...	50			6		15	71	

<sup>1</sup> Examples of some of the more commonly occurring phage patterns.

TABLE VD.  
Hospital CA: Distribution of Phage Groups among Strains of Staphylococci from Carriers and Patients.

Phage Group.	Strains of Coagulase-Positive Staphylococci from						Total.	
	Nasal Swabs.			Throat Swabs.		Materials from Lesions.		
	Number of Strains.	Phage Patterns. <sup>1</sup>		Number of Strains.	Phage Patterns. <sup>1</sup>			
Group I ...	4	52A 52/52A+ 44/52A 29		0		0	4	
Group II ...	0					0	0	
Group III ...	14	42E/73w 73 7/47/54/75/77 47/54/75/76/77+ 6/7/29/42D/42E/47/54/73/75+		3	47/54/73/75/76/77+	9	42E/73w 73+	
Unclassified ...	1					0		
Non-typable ...	5	6/7/29/42D/42E/47/54/73/75+		0	42E/44/76/77	0		
Total ...	24			4		9	37	

<sup>1</sup> Examples of the more commonly occurring phage patterns.

with phages 52 and 52A. While it was recognized that a "+" reaction or confluent lysis was desirable for typing, the recurrence of this characteristic weak pattern was striking and the strains were further investigated. Subsequent retyping produced similar patterns, and the strains were also lysed by the phages 42B and 47C. Strains giving the weak 7/42E/73 pattern were also isolated from the outbreaks of infection in hospitals MA and CA.

After the phage-typing had been completed, Dr. Phyllis M. Rountree, of the Fairfax Institute of Pathology, Royal Prince Alfred Hospital, Sydney, kindly sent me a preparation of a new phage (phage 80), which she found lysed strains responsible for neonatal infections and breast abscesses in New South Wales. All our available 7/42E/73 strains were tested with this phage, and the strains from hospital QV and hospital MA were completely lysed by the phage at the routine test dilution, while the strains from hospital CA were not lysed even by undiluted phage. On examination of the original phage patterns of the strains, it was found that strains from hospital CA had mainly given weak reactions with phages 42E and 73 and had never been lysed by 52 or 52A, while strains from hospitals QV and MA had been lysed by a combination of phages 7, 42E, 52, 52A and 73. This information was of great value in explaining the epidemiology of the infections. In the earlier stage of the investigation there seemed no reason why all three hospitals should have outbreaks of infection caused by the same strain of staphylococcus. The results from typing with phage 80 showed that hospitals QV and MA had staphylococci of the same phage pattern, while the staphylococci causing the outbreak of infection in hospital CA were of a different phage pattern. The staphylococci in hospital MA (the babies' hospital) were apparently introduced by infected babies coming from hospital QV. The epidemiology of these outbreaks is discussed in detail by McCartney and Yates.

#### Discussion.

The results obtained in this investigation agreed with those from phage-typing laboratories in other parts of the world. The actual phage patterns were identical with or similar to those reported by Williams and Rippon (1952), by Williams, Rippon and Dowsett (1953), and by Vogelsang (1953).

Blair and Carr (1953), using diluted phages, found that about 60% of their strains could be typed, and under similar conditions Vogelsang found that 62.9% of strains were typable. Williams and Rippon (1952) reported that about 40% of their strains were not lysed by phages used at their test dilution, and about half of these untypable strains were not lysed by undiluted phages. In the present study 53% of the strains were typed with the use of diluted phages, and a further 37% by the use of undiluted phages.

Group III strains were predominant among the staphylococci typed in this study, as in the investigations of Williams, Rippon and Dowsett (1953), Rountree (1953) and Vogelsang (1954). A fairly high proportion of strains fell into the unclassified group, mainly having patterns which were combinations of group I and group III, and sometimes of group II and group III.

In hospitals QV, MA and CA, where phage typing was carried out through the whole course of the outbreaks of staphylococcal infection, the results were useful in tracing the source of the infections. In hospital QV, phage typing proved that all the infections in mothers, babies and nurses were due to one type of staphylococcus, and two nurses in the nursery were found to be heavy nasal carriers of staphylococci giving this characteristic phage pattern. A number of babies in hospital MA had come from the maternity hospital QV, and were infected with staphylococci giving the phage pattern 7/42E/73w, which was prevalent in hospital QV. The infection in hospital CA appeared to have been spread by one nursing sister who was a heavy carrier.

It has been recommended that the "basic" set of phages for international use in phage-typing laboratories should contain 19 phages (29, 52, 52A, 79, 3A, 3B, 3C, 55, 6, 7, 42E,

47, 53, 54, 70, 73, 75, 77 and 42D), plus any extra phages which are useful in that area (Rippon, 1953). One such phage which would be included here is Dr. Rountree's phage 80.

#### Summary.

Two hundred and sixty-two strains of coagulase-positive staphylococci have been examined with the use of a basic set of 20 phages plus an additional set of nine phages. Of the strains, 53% could be typed with diluted phages and a further 37% with undiluted phages; 55.7% of the strains fell into group III.

The results of phage typing have proved valuable in tracing the epidemiology of particular outbreaks of infection.

#### Acknowledgements.

I wish to thank Dr. Phyllis Rountree for sending me her new phage 80 and for information about outbreaks of infections caused by this phage type of organism. I am also grateful to Dr. Joan E. Rippon, Central Public Health Laboratory, Colindale, London, for helpful advice on methods of phage propagation. My thanks are also due to Mr. L. R. Rowett, Senior Technician, Institute of Medical and Veterinary Science, for valuable technical assistance.

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#### CONTROL OF AN EPIDEMIC OF ACUTE INFECTIVE ENTERITIS OF THE NEWBORN.<sup>1</sup>

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AND

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DURING February, 1955, an outbreak of acute infective enteritis of the newborn occurred at the Royal Women's Hospital, Melbourne. The number of babies affected was not great. However, it is considered that the epidemic would have assumed more serious proportions but for the essential measure taken to prevent cross-infection. This

<sup>1</sup> Read at a meeting of the Paediatric Society of Victoria on June 8, 1955.

measure, an extension of the concept of "rooming-in", was that after delivery the mother alone cared for and handled her baby. The aim of this report is to draw attention to the value of this procedure as a method of preventing spread of infection from baby to baby by the attendant staff.

#### Bacteriological Considerations.

The causal organism was *Salmonella typhi-murium*. Consideration will be limited to those cases, 23 in number, in which cultural examination of the stool gave a positive result. In addition, principally in the first two or three anxious days of the outbreak, there were several babies, initially clinically suspect, of whose stools repeated bacteriological investigations gave negative results. There was also one baby in whom the infecting organism was a different strain. This organism was also isolated from the faeces of the mother, and the case was presumably an example of direct spread of infection from mother to baby.

#### Clinical Picture.

The first signs of infection were the appearance of blood and mucus in the stools and, in most cases, a simultaneous rise in the baby's temperature, at the most to 102° F.

The subsequent clinical course was mild and short-lived. The stools were faintly offensive and slightly more fluid and frequent than normal. Their colour was variable, for in most cases, because of the baby's age, they were basically transitional in character. It is of interest to note that the youngest baby, at the time of the recognition of clinical infection, was aged twenty-eight hours. In the older babies, when the stools had been of a golden colour, they assumed a greenish hue. More particularly in those cases in which the greater elevation of the temperature occurred, the baby was lethargic and disinclined to suck, and some infants needed gavage feeding.

In all cases, within five days the temperature had returned to normal, and the stools, except for the occasional appearance of very small amounts of mucus, were of normal character. Vomiting was not a feature of the infection. That the disease was mild is shown by the fact that in no case was parenteral fluid and electrolyte replacement necessary.

There was one death. The baby was gravely ill from a congenital heart lesion and pneumonia, and death can be more correctly ascribed to these than to the supervention of acute enteritis.

#### Treatment.

An adequate fluid intake was ensured in the initial phases of the infection by bottle or gavage feedings every three hours. A 5% solution of glucose in water or a 4% solution of glucose in one-fifth normal saline was given. As the clinical condition of the baby improved, these were replaced by dilute solutions of condensed milk, and the strength was gradually increased. With the return of the stools to normal the baby was gradually graded onto feedings of breast milk. The vitamin B group and vitamin K were given by injection, and vitamin C by oral administration.

"Terramycin", in the form of an oral suspension, was prescribed in two strengths. Some babies were given a total daily dose based on the formula 12.5 milligrams for each pound of body weight *per diem*, others were given 50 milligrams for each pound of body weight *per diem*. The total calculated daily dose was divided into four equal parts, and these were given every six hours. "Terramycin" therapy was continued for two days after the stools had assumed a normal character. There was no apparent difference in the response to the different levels of dosage, and, indeed, the question as to whether this antibiotic had any influence on the disease remains open. The stools of the majority of the babies on their discharge from hospital, even three or four weeks after the acute enteritis had completely subsided, still yielded cultures of *S. typhi-murium*.

#### Course and Control of the Epidemic.

The course of the epidemic has been represented graphically (Figure I). Only cases in which there was bacteriological proof of infection are included. On each of the first three days of the outbreak three new cases presented, and by then three of the four baby wards and the premature baby nursery of the hospital were involved. Thus the outbreak was widespread. In addition, there were several "suspect" babies who, by their subsequent clinical course and by stool culture, were later found not to be infected.

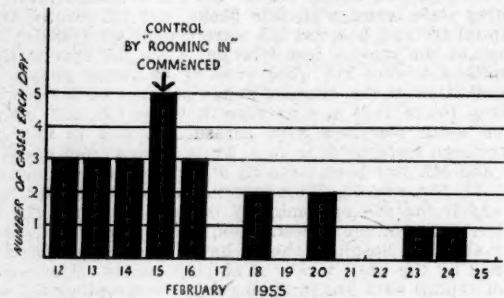


FIGURE I.  
Graph showing the number of new cases of acute enteritis reported each day. Control by strict "rooming in" commenced on February 15.

During this time all suspected babies were isolated immediately in a special nursery and cared for by a staff not undertaking duties elsewhere in the hospital. Suspected babies whose stools yielded positive cultures and those who clinically appeared to have an undoubted infection were segregated in another nursery.

An immediate search was made for the source of the infection. This included an investigation of feed-preparation room technique and utensils, the questioning of all staff and patients as to whether they were suffering from or had recently suffered from gastro-enteritis, and the checking of staff movements. In certain instances bacteriological examinations were performed. The source of the infection was not found. It was known that, at the time, there were many cases of gastro-enteritis occurring throughout the community, and it was concluded that the outbreak was probably due to a symptomless carrier or carriers.

The attention of the staff was drawn to the importance of a high standard of personal hygiene, and the nursing attendants were instructed to scrub their hands thoroughly both before and after handling any baby, and to use all towels only once. The necessity for care in the sterilization of bottles and teats and the preparation of artificial feeds was emphasized. No teat was to be touched by hand; it was to be placed on the bottle by sterile forceps. A campaign was carried out to eliminate all flies from the hospital, although it was believed that they were very unlikely to be the carriers of the infection, as cases had occurred in the premature baby nursery from which all flies were very strictly excluded. Routine test weighing of babies was temporarily suspended. Each baby was to be weighed on the third and sixth days after delivery and before discharge from hospital. When this was carried out, it was stressed that a fresh clean napkin must be put on the scale before each baby was placed there.

On the third night, the source of the infection remaining unidentified, it was decided to further the measures aimed to prevent cross-infection by introducing an extension of the principle of "rooming-in". From that time, in all possible cases, each baby was handled and cared for by its mother only, for the full twenty-four hours of the day. The baby's cot remained beside the mother's bed, and she

alone undertook the necessary changing and oiling of the baby and the giving of any feeds. She was provided daily with a supply of clean napkins and also with a waterproof bag in which all soiled ones were placed after inspection. The baby, in its cot, was removed from the ward only if it created any persistent disturbance at night. It is noteworthy that this was very seldom necessary. When it became quiet again, it was returned to its mother. The only babies that required care by the staff were the premature babies, those who were ill and those whose mothers' condition precluded them from looking after their babies. They comprised less than 20% of the 140 to 150 babies delivered each week in the hospital.

In the next thirty-six hours, eight further cases of acute enteritis were reported from various nurseries, including the sole remaining nursery in which infection had not previously occurred. It was thought, when the probable incubation period of the disease was taken into account, that these eight babies were all likely to have been infected before the foregoing measures had been taken.

On the following day, the sixth day, no case of acute enteritis occurred. During the succeeding week there were six further cases, again from various wards, and then the outbreak ceased. A study of the circumstances of these last six cases is of great interest, for in five of them complete maternal care as outlined above was not possible. Two of the babies came from the premature nursery, two of them had been delivered by Caesarean section and had been cared for in the nursery because of their mothers' condition, and one, gravely ill from a congenital heart lesion and pneumonia, also required nursery care. The remaining baby was readmitted to hospital, having developed acute enteritis three days after discharge, and in this case infection could well have occurred in the home. It may be therefore stated that, after allowance had been made for the probable incubation period of the condition, no case of acute enteritis occurred in any baby, whilst in hospital, whose entire care was solely in the hands of its mother.

#### Summary.

1. An outbreak of acute enteritis of the newborn in a large maternity hospital is reported.
2. The causal organism was *S. typhi-murium*.
3. The clinical features and the treatment of the condition are outlined.
4. The methods taken to control the spread of infection are presented, and in particular the value of an extension of the concept of "rooming-in" in preventing cross-infection by the attendant staff is emphasized.

5. After the introduction of strict "rooming-in", in which the mother alone handled and cared for her baby, and when allowance is made for the probable incubation period of the disease, all subsequent cases of acute enteritis occurred among babies for whom this method of management was not possible, or in one instance after the baby had been discharged home. No infection developed in any baby whose whole care was solely in the hands of its mother.

#### Addendum.

It was observed that there was a considerable reduction in the incidence of minor neonatal staphylococcal skin and eye infections in the hospital during the four-week period in which the policy of complete maternal care of the baby was strictly enforced. These infections, which are endemic in most large maternity hospitals, present a growing problem, because the staphylococcus is becoming resistant to an increasing number of antibiotics.

After return to the normal hospital procedure of part maternal and part staff care of every baby, it was found that the incidence of these infections again increased. As a consequence, a policy of strict maternal care of all babies, whenever possible, has been reintroduced at the Royal Women's Hospital, Melbourne.

## Reports of Cases.

### A SECOND INFECTION WITH LEPTOSPIROSIS.

By R. L. DOHERTY,

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THE patient who is the subject of this report had two distinct attacks of leptospirosis, due respectively to the "Kremastos" and *hyos* serotypes, with onset dates thirty-two days apart.

A., aged fifteen years, a schoolboy, of Babinda, north Queensland, was admitted to the Babinda District Hospital on July 23, 1954, complaining of headache and feverishness of one day's duration. He "felt hot and cold", had vomited several times, and complained that the light hurt his eyes; he had no symptoms referable to the respiratory or urinary tract. On examination of the patient, his temperature was 102° F., his conjunctive were injected, and his axillary and inguinal glands were palpably enlarged; no abnormalities could be found in his chest or abdomen, and he had no rash or eschar. His doctor considered that he was suffering from scrub typhus, and commenced treatment with chloramphenicol (one gramme immediately, then 500 milligrammes six-hourly). The course of his illness is shown in Figure I. He remained febrile for sixty-seven hours after the first dose of antibiotic. He was afebrile on July 27, and felt much better. Chloramphenicol therapy was continued until July 30, and he was discharged from hospital on July 31.

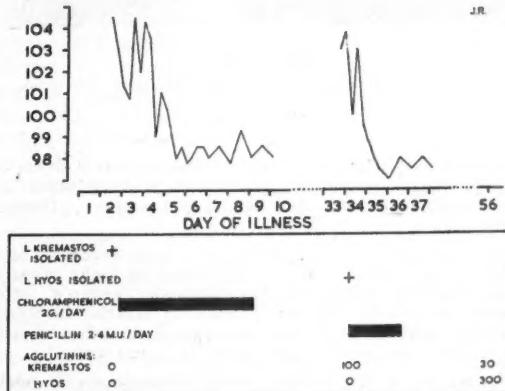


FIGURE I.  
Temperature charts of A.'s illnesses.

He had a sudden onset of shivers, headache, sore eyes and pain in the back and the knees on August 23, 1954, and was readmitted to hospital on the same day. On examination of the patient, his temperature was 104° F., he was shivering violently, and his pulse rate was 116 per minute; he had an infected leech bite on his left ankle, a cut under his left foot, and a large tender lymph gland in his left groin. His conjunctive were engorged; no abnormality could be found in his chest or abdomen. Penicillin therapy in a dosage of 400,000 units four-hourly was commenced on August 24. He was afebrile on August 25, and penicillin treatment was stopped on August 26. He was discharged from hospital on August 28. The course of his illness is shown in Figure I.

Leptospiræ were grown from blood taken on July 23 and August 24. The strains were identified as belonging respectively to the "Kremastos" and *hyos* serotypes. Serological tests showed successive antibody responses to the two serotypes; on July 23 there was no response to either;

on August 24 "Kremastos" was agglutinated at a titre of 1 in 100, while *hyos* was not agglutinated, and on September 15 "Kremastos" was agglutinated at 1 in 30 and *hyos* at 1 in 300. The thirty-fourth and fifty-sixth day sera contained antibodies against *Leptospira icterohaemorrhagiae* and *L. canicola* in low titre; tests with the other north Queensland serotypes gave negative results.

The manner in which A. appears to have been infected is of some interest. Before each illness he had spent a number of days in the Bartle Frere area (about fourteen miles from Babinda). He spent the days in the scrub, shooting pigeons and following the tracks of wild pigs; he did not see or shoot a pig, but frequently walked barefooted through swampy land where their tracks were evident (Figure II). There is an obvious possibility that his *hyos* infection came from pigs. The animal host of "Kremastos" is unknown. Apart from this, the scrub in



FIGURE II.

Swampy soil in rain forest at Bartle Frere, where A. may have been infected. There were many tracks of wild pigs evident.

which he went, with its swampy areas, and the rivers in which he swam are features familiar in previous epidemiological studies of north Queensland leptospirosis (Derrick *et alii*, 1954).

Second attacks of leptospirosis have been recorded on a number of occasions. Gsell (1954) reported eight cases in Switzerland in which second attacks occurred after intervals of two to fourteen years. In six the serotypes concerned were *pomona* and *hyos* in that order, in one *hyos* and *pomona*, and in one *australis A* and *hyes*.

Of a series of 115 patients with leptospirosis in north Queensland (Doherty, 1955), four had previously had confirmed attacks of leptospirosis. One had infections with *australis B* and *australis A* six months apart, one *australis B* and *hyos* at a similar interval, one "Robinson" and "Szwajzak" three years apart, and one *australis B* and *australis A* sixteen years apart. A further 13 had agglutinins in sera taken in the early days of their illness, which suggested that the illnesses investigated were not their first bouts of leptospirosis. In the case of the patient with *australis B* and *hyos* infections, the second illness was very mild, and it was suggested that its course may have been modified by some degree of immunity.

The second illness in the present case had a total duration of fever of only two days, but this shortening of time may have been due to the high dosage of penicillin employed.

The presence of 13 serotypes of leptospire in north Queensland (Smith *et alii*, 1954; Smith, 1955) makes the possibility of repeated infections important. There is a growing body of evidence that infection with a member of one serogroup does not produce immunity against other serogroups; however, there is no record of second infections with different members of the same serogroup.

#### Summary.

The case history is given of a patient who had two attacks of leptospirosis thirty-two days apart, due to the "Kremastos" and *hyos* serotypes. The relevant literature is discussed.

#### Acknowledgements.

The writer is indebted to Dr. A. Bradshaw and Dr. J. B. Taylor, who treated the patient in his successive illnesses; to Miss M. L. Emanuel, who isolated the leptospiral cultures at Innisfail; and to Dr. J. I. Tonge and the staff of the Laboratory of Microbiology and Pathology, Brisbane, for the identification of the strains and the serological tests.

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#### Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Classification for Medical Literature", by Eileen R. Cunningham, with the collaboration of Eleanor G. Steinke; Fourth Edition: 1955. Nashville: The Vanderbilt University Press. 8 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ ", pp. 184. Price: \$2.75.

The third edition was published in 1945.

"An Atlas of Regional Dermatology", by G. H. Percival, M.D., Ph.D., F.R.C.P.E., D.P.H., and T. C. Dodds, F.I.M.L.T., F.I.B.P., F.R.P.S.: 1955. Edinburgh and London: E. and S. Livingstone, Limited. 9 $\frac{1}{2}$ " x 6", pp. 272, with 475 illustrations. Price: £5.

Intended as an aid to the diagnosis of diseases of the skin.

"Thallium Poisoning", by J. J. Frick, W. G. Silveis Smith and L. Muller; 1955. Amsterdam, Houston, London, New York: Elsevier Publishing Company. London: Distributors, Cleaver-Hume Press, Limited. 9 $\frac{1}{2}$ " x 6", pp. 164, with 21 illustrations. Price: 19s.

People in medical and non-medical circles are not as a rule well informed about thallium; one of the aims of the book is to change this state of affairs.

"The Princes in The Tower and Other Royal Mysteries", by Sir Arthur Salusbury MacNulty, K.C.B., M.A., M.D. (Oxon), F.R.C.P., F.R.C.S.: 1955. London: Christopher Johnson. 8 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ ", pp. 212. Price: 18s.

The author examines ten historical mysteries chiefly from the medical point of view.

"From Witchcraft to Antiseptics: A Study in Antithesis", by Douglas Guthrie, M.D., F.R.C.S.; Logan Clendening Lectures on the History and Philosophy of Medicine; Fifth Series; 1955. Lawrence: University of Kansas Press. 8 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ ", pp. 64. Price: \$1.50.

Divided into two parts: "Witches and Witch-Doctors" and "Lister and His Achievement".

"Introduction to Hepatic Surgery", by Henry Gans, M.D., with an introduction by A. Brunschwig, M.D.; 1955. Amsterdam, Houston, London, New York: Elsevier Publishing Company. London: Distributors, Cleaver-Hume Press, Limited. 9 $\frac{1}{2}$ " x 6", pp. 284, with 120 illustrations. Price: 70s.

The author presents a method of controlling the blood supply of the liver at the hilum which makes surgery of the liver possible.

## The Medical Journal of Australia

SATURDAY, JANUARY 14, 1956.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the *Quarterly Cumulative Index Medicus*. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

### THE HEALTH OF GREAT BRITAIN.

THE report of the Ministry of Health of Great Britain for the year ended December 31, 1954, was presented by the Minister of Health to Parliament by command of Her Majesty in September, 1955. Part I of this report has been issued. It is a formidable document of some 242 pages, but just under 100 of these consist of various appendices. By far the larger section deals with the National Health Service. In the very much smaller section welfare, food and drugs and civil defence are considered as well as services for the elderly, the handicapped and the homeless. At the end of the first section there is a chapter on international health.

The total cost of the National Health Services for England and Wales for the financial year ended March 31, 1954, amounted to about £437,000,000. Nearly four-fifths of the cost amounting in the financial year to about £367,000,000 was met by the Exchequer out of money voted by Parliament. The remainder of the cost was met by rates levied by local authorities for local health authority services, by charges to persons using the services, by superannuation contributions and by a transfer from the National Insurance Fund. The total cost of the service was about £13,000,000 less than that of the previous year, but the previous year included about £25,000,000 in respect of earlier years for remuneration to medical practitioners at increased rates according to the Danckwerts award. It is interesting to note that payments by persons using the services were larger than in the previous year, and represented about 5% instead of 4% of the total cost; this was attributable partly to the fact that this was the first full year of the charges authorized by the *National Health Service Act, 1952*.

In the chapter on hospital and specialist services, emphasis is laid on the "striking fact" that in the develop-

ment of the hospital service in 1954, there was a considerable reduction in waiting lists, and therefore in the average time for which patients had to wait. The Minister for Health lays emphasis on this fact in his formal introduction presenting the report to Her Majesty. He describes it as the most substantial reduction for any one year to be recorded since the National Health Service began. It is, he states, welcome not only for the saving of distress and anxiety to the patients concerned and their relatives, but also because it reflects the increased efficiency in the management of hospital beds. The previous year's report showed that there had been a peak in the waiting lists in 1950, and that this was followed by a sharp decline and that another peak occurred in 1953. The figure for 1954 shows a reduction in the numbers on the waiting list of no less than 49,277; if mental and mental deficiency hospitals are included, the total becomes 51,564. The reduction is not evenly spread throughout the country or throughout the service. This is not surprising, but we note that the reduction in the non-teaching hospital waiting lists ranges from 0% in one region to 22% in another; and the regional figures for the number of persons waiting per bed varied from 0.5 to 2.7. When the hospital waiting lists are considered according to specialties, we note that the greatest percentage reduction has occurred in tuberculosis hospitals. The percentage reduction in regard to general medical beds was 12. For general surgery it was 5.5, and for ear, nose and throat beds it was 16. The percentage reduction for gynaecological beds was only one. This does not mean that there has been any significant fall in the demand for the services of hospitals. On the contrary, the number of in-patients and out-patients continues to increase. It means that the hospital service is able to meet the increased demands made upon it. The number of beds available for patients increased during the year 1953 by 5487, from 471,036 to 476,523. The additional beds could not alone account for the treatment of as many as 87,000 additional patients, especially when mental and mental deficiency patients were included in the count. One important action of which we should take note is that during the year the Minister announced the decision to set up within the Ministry a small group of medical and technical officers to study basic questions of hospital design, with the idea of preparing and disseminating bulletins of information on the best current practice and suggestions for the solution of some of the problems confronting the designer of hospital buildings.

The position in regard to tuberculosis should be noted. In addition to the decline in mortality from this disease in recent years, the most significant trend during 1954 was the further accentuation of the downward curve of tuberculosis notifications in spite of better diagnostic facilities. The waiting list for hospital beds for tuberculous patients has fallen from 10,986 at the end of 1949 to 3017 at the end of 1954. During 1954 there were 35,069 tuberculosis beds. This was an increase of 147 beds for patients with respiratory tuberculosis since 1953. The trend of improvement has been maintained "under the influence of the new drugs and improved methods of treatment which have shortened the average period of institutional treatment and increased the usefulness of available staff beds for tuberculous patients". Interregional assistance is given, for patients from regions in which there is a high waiting list are sometimes transferred to regions

in which the waiting list is not so great. During the year 131 men and 130 women were sent for an average treatment of six months to Switzerland. The accommodation available in Switzerland has been fully utilized, but it became evident during the year that fewer men than women could be found willing and suitable to take treatment under the scheme. It has become increasingly clear that the concentration of effort by mass miniature radiography units on "black areas" and on specially susceptible groups is one of the most fruitful contributions which these units can make. The number of units during the year increased from 66 to 69, and the number of persons examined during the year was over 3,000,000, compared with 2,751,843 in 1953. B.C.G. vaccination, which was originally made available on a controlled experimental basis, has been offered to children in their last year before leaving school, as well as to the nursing profession and medical students through hospitals and to other individuals at special and known risk. A total of 105,499 vaccinations was carried out during the year.

In connexion with the National Blood Transfusion Service it is pointed out that the steady increase year by year since 1949 in the total effective panels of blood donors has been maintained. During the year under review, the effective blood donors reached a total of 540,389, but it is estimated that a further increase of about 25% on the effective donor panel is needed to meet the probable growth in demand. The number of blood donations during the year showed an increase of over 6%. This figure exceeds by over 30,000 the peak figure of blood donations during the war. We read that the maintenance of supplies of blood in the hospital blood banks to ensure that blood of the right group is immediately available to meet any need has become an essential part of modern hospital service. It is strange that no mention is made of the unnecessary use of blood in clinical practice which must be occurring in the old country in the same way as it is occurring in Australia. In the reports for 1952 and 1953 mention was made of the policy of making hospital X-ray and pathological services directly available to general practitioners wherever possible. A new method of recording the work carried out in hospital X-ray and pathological departments has been introduced, but the period has been too short to enable definite conclusions to be drawn in regard to any apparent trend; until the figures for future years have been obtained and studied it will not be possible to present a fully reliable picture.

The welfare of in-patients in hospitals is discussed, reference being made to a report on the reception and welfare of such patients, prepared by a committee of the Central Health Services Council and published in 1953. In that report stress was laid on the fact that hospitals belong to the few organizations which have to care for those whom they serve for twenty-four hours a day, and that on this account they have a responsibility for patients as people, in addition to the immediate responsibility of dealing with the bodily ailment which is the cause of their presence in hospital. Readers will remember that this has been discussed in these columns on previous occasions under the heading of "The Patient is a Person" and "Even Children are People". We read that the Minister has recently obtained from regional hospital boards and boards of governors reports on the progress made in giving effect

to recommendations of the report. The general picture which emerges is "one of a genuine and continuing effort to diminish as far as possible the institutional aspects of hospital life and to make the patient's stay in hospital as congenial as possible". The Australian reader will not be surprised to see that the report of the Central Health Services Council and the Minister's memorandum recognize that financial stringency might delay the complete implementation of some of the recommendations. Financial difficulties have delayed anti-noise precautions. Mention is made of fitting silent lift doors; the reply, of course, should be that noisy lift doors should not have been installed in a hospital in the first instance. The same statement might apply to the fitting of rubber tires to trolleys for use in the wards. Diversional facilities for patients and occupational therapy are also referred to, and the activity of voluntary organizations who undertake work of this kind is appreciated.

In March, 1953, the Minister issued a memorandum urging all hospital authorities to allow the daily visiting of children in hospital by their parents under adequate safeguards against the introduction or spread of infection. Inquiry before the issuing of the memorandum showed that out of 1235 non-teaching hospitals receiving children as in-patients, only 271 allowed daily visiting, while 141 prohibited all visiting, save in emergencies. The position has changed since then. The number of all hospitals in which daily visiting is allowed has approximately trebled and is now 856, while only 28 hospitals do not normally permit visiting. Visiting is allowed on at least three days a week at 75.5% of hospitals. Daily visiting seems to work smoothly in practice; it appears to have no harmful effects, particularly in regard to emotional disturbance of the children and the introduction of infection, which were at one time feared. There have been very few instances in which a hospital trying daily visiting has abandoned it. There is every indication that the number of hospitals allowing daily visiting will continue to increase.

The question of the periods of time spent by patients waiting in out-patient departments is discussed. The criticisms directed to this problem are mentioned and a review is being made by hospital authorities of the present existing arrangements. Presumably in the next annual report the results of this review will be set out. The questions of hospital staffing and of hospital finances are discussed, but cannot be included in this review.

The chapter on the general medical services deals with the structure of general practice and the manner in which it is conducted under the British system. The facts set out here are in all probability fairly well known to Australian practitioners, and, of course, it is impossible to set them out in full in this place. The facts and their implications show that private medical practice as it is known in Australia is completely non-existent at the present time in Great Britain. The practitioner has lost his freedom. He has become the slave of his patient and the servant of the bureaucrat. We in Australia should realize what this means and should use every means in our power to close any gaps of dissension in our ranks so that it will be impossible for any government in Australia to adopt anything resembling the British scheme. We can do this by faithful observance of the conditions of

our present National Health Service and by seeing that those around us do the same. We should remember that any unworthy act by a practitioner—in other words, any act of which the profession as a whole would be ashamed—helps to forge a weapon that may be used against us in any possible stressful times that lie ahead. In England what are known as initial practice allowances have been paid to medical men who are willing to practise in unattractive areas. A medical man in the old country cannot practise just where he likes. Whether he will be permitted to do so depends largely on the locality which he chooses. When a vacancy occurs by death or retirement, that vacancy may be advertised and as many as fifty or sixty applications may be received for it. In this report reference is made to the difficulty experienced by doctors wishing to enter general practice, in particular by those who apply for advertised vacancies in single-handed practices. It is suggested that in view of the intense competition in the south of England, a doctor looking for a vacancy will be well advised to look to the north as a place of work. The chief mode of entry into general practice is through assistantship or partnership. We read that the number of so-called permanent assistants is decreasing. In 1953 the number of firms employing assistants was 1514. In 1954 the total was 1451. It is not to be wondered at therefore that the number of doctors engaged in group practice is increasing. The numbers and different types of group practice are set out in one of the appendices to the report. It has been pointed out in these columns on more than one occasion in the past that group practice is an expensive business. This is recognized in Britain, and a fund has been set aside to the tune of £100,000 a year to provide interest-free loans for doctors who wish to establish or to improve central surgery premises from which to carry on group practice. That this is a useful provision is shown from the fact that during 1954 applications were received for no less than £413,000, and 36 applications involving about £159,000 were approved in principle.

There is much more in this report to which reference could be made. The details that have been given are of interest in themselves, and from the general picture which they help to create readers will, we hope, be able to draw useful conclusions of their own. If possible readers should refer to two previous descriptions and discussions on general practice in this journal on October 31, 1954, and September 25, 1954. It has been said that man knows nothing but what he learns from his own experience; on the other hand, we have been advised to draw from other people's dangers the lesson that may profit ourselves.

## Current Comment.

### POLYCYTHÆMIA.

FIRST-HAND study of 303 cases of polycythaemia (231 of *polycythaemia vera* and 72 of secondary and relative polycythaemia) is uncommonly good experience and provides John H. Lawrence<sup>1</sup> with excellent qualifications to write on the subject. As he points out, most doctors have only a

limited acquaintance with the condition; and it is well that he has recorded his experiences, in view of the difficulties that occur in diagnosis and treatment, and also of the fact that *polycythaemia vera* can now be treated satisfactorily.

The general term polycythaemia is used to mean simply an increase in the number of red cells in the blood. Most commonly it is associated with the condition known as *polycythaemia vera*, which was first described by M. H. Vaquez in 1892 and further reported by William Osler in 1903. Secondary polycythaemia is the result of an insufficient supply of oxygen in the blood, and is commonly found in patients with certain types of heart and lung abnormalities, and in people who live at high altitudes. In a third group, comprising 31 in Lawrence's series, are patients with a condition which is like and yet unlike *polycythaemia vera* and is described as relative polycythaemia. We shall refer briefly to Lawrence's findings in relation to each group. He states that in *polycythaemia vera* the most common symptoms are headache, dyspnoea or orthopnoea, dizziness, eye complaints and epigastric distress. The average age of onset is fifty-two years, the highest incidence being in the age group from sixty to seventy years. The incidence ratio of males to females is 1.32. On physical examination of the patients, ruddiness of the face and mucous membranes is found in 62%, palpable enlargement of the spleen in 66% and of the liver in 33%, and hypertension in 50%. White cell counts over 10,000 per cubic millimetre are common. The coefficient of correlation between the total number of circulating white cells and the total number of red cells is 0.75; this, Lawrence points out, emphasizes the fact that the condition is one involving both the red and white cell series. He states that the sternal marrow puncture findings are of limited value for diagnosis and evaluation of therapy, but examination of bone marrow sections is of great value. The blood volume is increased as a result of a high red cell volume, but usually there is a decrease in plasma volume. The viscosity of the blood is increased. Tracer studies with Fe<sup>55</sup> indicate that much more iron is used than is needed for maintaining the high total red cell volume, while studies with C<sup>14</sup> show that there are two populations of red cells, one with a normal life span and one with a short cell life. Thus, as Lawrence points out, the disease has a neoplastic character, with an increased rate of red cell production but no lengthening of red cell life span. There is no clear evidence that bone marrow hypoxia is a cause of the hyperactivity of the marrow, but recent studies have demonstrated a humoral erythropoietic factor which may be the cause of the increased red cell production. Pulmonary hyperoxia does not decrease the rate of formation of red cells, as it does in secondary polycythaemia.

Lawrence considers the treatment of *polycythaemia vera* at some length. He points out that the logical way of treating it would be to reduce the bone marrow metabolism to normal or to inhibit the humoral or nervous stimuli reaching the bone marrow. However, no successful therapy on this basis has eventuated up to the present, and relatively crude methods of treatment, such as venesections, phenylhydrazine and other chemical agents, and total-body X-ray irradiation, have been the conventional methods of treatment. Lawrence states that since the introduction of radioactive phosphorus for the treatment of the condition in 1938 practically all patients with *polycythaemia vera* studied by him and his immediate colleagues have been treated with radioactive phosphorus (P<sup>32</sup>), in general given intravenously, either alone or in combination with venesection. A small number of selected patients have been treated with venesection alone. Lawrence regards radioactive phosphorus as superior to other available isotopes. In his experience it brings about a reduction in total red cell volume and an alleviation of symptoms, decreases splenomegaly and blood volume, and prolongs life to near normal. The incidence of leukaemia is shown to be no higher than that previously reported after other forms of therapy and probably is lower. Before the use of radioactive phosphorus the most common cause of death was haemorrhage or thrombosis; marrow inhibition with

<sup>1</sup> "Polycythaemia: Physiology, Diagnosis and Treatment Based on 303 Cases", by John H. Lawrence, M.D., D.Sc., F.A.C.P.; Modern Medical Monographs; 1955. New York and London: Grune and Stratton. 8<sup>1</sup>/2" x 5<sup>1</sup>/2", pp. 144, with 38 illustrations. Price: \$5.50.

radioactive phosphorus has reduced the proportion of deaths from these causes by about half. The average duration of life after onset of the disease in the whole series has been about fourteen years.

The condition of relative polycythaemia is given a short chapter of its own in this monograph. Lawrence states that it occurs mainly in men in the fourth or fifth decades and is characterized by a pathologically low plasma volume like that associated with dehydration. About one-half of the patients affected are obese, and about one-half are hypertensive. White cell and platelet counts are normal. About one-half of the patients show overt nervous stress and strain. The patients, Lawrence states, should not be treated with radioactive phosphorus, since they have normal total red cell volumes. The condition is apparently not rare and can be mistaken for *polycythaemia vera*. It also occurs in persons suddenly exposed to hypoxia, but in this situation continued hypoxia leads to secondary polycythaemia.

Secondary polycythaemia occurs in persons with cardiac or pulmonary disease resulting in an insufficient supply of oxygen in the blood, and in those who reside at high altitudes. Lawrence and his associates have carried out studies in Peru, where there are over 165,000 people living at a height of between 14,000 and 16,400 feet in the Andes. Lawrence states that secondary polycythaemia is characterized by an increase in the number of red blood cells and in the haemoglobin value, but there is no increase in the number of leucocytes or platelets; nor is there splenomegaly. The blood volume is increased as the result of an increase in the total red blood cell volume; and, as in *polycythaemia vera*, the plasma volume is usually decreased. The blood oxygen saturation is low. Red cell iron turnover studies show a red cell production rate that is several times normal, but compatible with the total red cell volume. The life span of the red cell is normal. Lawrence points out that secondary polycythaemia is a normal physiological response to hypoxia and rarely should the polycythaemia itself be treated.

This brief summary scarcely does justice to the excellent material presented clearly and readably by Lawrence. It should be sufficient, however, to attract to a reading of the original monograph those who are interested in the subject, whether from a physiological, a pathological or a clinical point of view.

#### THE PREVENTION OF RHEUMATIC FEVER.

THE recognition that rheumatic fever is not a specific disease, but that it is a profound disturbance of connective tissue metabolism in response to the toxins of the haemolytic streptococcus, has done much towards clarifying the aetiology of the condition, and has pointed some way towards the prevention. Wherever young people live together communally, the responsible physician has ever before him the possibility that rheumatic fever will strike and leave behind it a trail of chronic ill health, leading, sooner or later, to the failure of a beaten myocardium. Paediatricians and medical officers of the armed forces are particularly aware of the problem, and any suggestions which may assist in the prevention of the illness are always eagerly assayed.

In a recent symposium on preventive medicine, J. H. Hubbard,<sup>1</sup> of the University of Pennsylvania, has discussed the prevention of rheumatic fever. He first suggests that it is accepted practice that the prophylaxis of succeeding attacks of rheumatic fever should be by the routine administration of a sulphonamide or of a penicillin preparation. He accepts the figure of 3% for the incidence of first attacks of rheumatic fever following haemolytic streptococcal infection of the throat. C. H. Ramelkamp, L. W. Wannanake and F. W. Denny<sup>2</sup> treated a large number of servicemen infected by the haemolytic streptococcus, using a ten-day course of penicillin. They found that the incidence of rheumatic fever was about one-eighth that

among similarly infected men who were not treated. The general application of this mass therapy to children needs considerable thought, and further large surveys of this nature are to be arranged in the United States of America. J. P. Hubbard does not support the claim that penicillin should be given to all patients with associated pyrexia and sore throat, but apparently feels that there should be some evidence that the haemolytic streptococcus is the causative organism before antibiotics are used. However, he expresses the view that penicillin should be given to patients with the typical text-book signs of an acute streptococcal infection of the throat. He recognizes that some such infections produce only moderate signs, and suggests that in such cases confirmatory bacteriological examination of the naso-pharynx should be made. Finally he suggests that acute severe reactions to penicillin are rare enough not to influence the routine use of this antibiotic.

Few physicians would disagree with Hubbard in his desire to find a means of preventing the disastrous effects of rheumatic fever. But his assumption that a routine sulphonamide and penicillin prophylaxis is general after the first attack of rheumatic fever does not hold good for British medicine. Here greater stress is laid upon placing the affected child in an environment where streptococcal cross-infection is unlikely. Secondly the improved social conditions encourage natural good health, and do not encourage that feeling of personal abnormality so easily induced in the child requiring daily therapy.

In the treatment of the previously unaffected child infected by the streptococcus, no mention has been made of the use of the sulphonamides. These are easy to administer, are usually effective, and are much preferred by the child to the assault by the hypodermic needle. Some physicians will not agree that antibiotic or bacteriostatic drugs should be used unless the general toxæmia is considerable. Penicillin reactions are not by any means uncommon, and the development of penicillin-resistant strains will certainly be accelerated by the wholesale use of the antibiotics. Further, if all children with mild infections of the throat are to have throat swabs taken, the labour and expense during seasonal epidemics of respiratory infections will be Herculean. At the same time it is common experience that rheumatic fever arises after a haemolytic streptococcal infection which has been so mild as to escape the notice of even the child himself. Perhaps, to be more realistic, and accepting the urgency of the problem, we should turn our attention more to the prevention of rheumatic fever by reducing conditions which favour cross-infection, by encouraging maximal natural resistance to disease, and by studying means which may reverse the acute collagenous process once the first signs of the rheumatic diathesis appear.

#### THE DISPOSAL OF THE MONGOLOID CHILD.

THE problem of what to do with the mongoloid child bristles with difficulties. In other cultures than ours such children were unwanted and were disposed of deliberately according to accepted custom. In our own society they have usually been retained within the family, and mostly have been cared for with genuine affection mingled with varying amounts of embarrassment. More recently strong opinions have been expressed to the effect that these children should be separated from the mother at birth and committed to an institution—a course that has in some cases been accepted and followed; but its wisdom is highly debatable, as has been well brought out by Alastair Beddie and Humphry Osmond.<sup>3</sup> They centre their thinking around Rosebud, who is in a corner of the baby ward. The nurses have called her Rosebud because no one knows her real name. When the obstetrician saw that she was mongoloid he separated her from her mother, who left hospital without seeing her—in effect, without being allowed to see her.

<sup>1</sup> Ann. Int. Med., September, 1955.

<sup>2</sup> Bull. New York Acad. Med., May, 1952.

<sup>3</sup> Canad. M. A. J., August 1, 1955.

The paediatrician in consultation had agreed with the obstetrician's diagnosis and recommended that the baby should go to an institution. Thus, as Beddie and Osmond put it, two men, one of whom specialized in delivering babies and the other in looking after children, have made a clinical judgement which has somehow effected a social, ethical and moral revolution. We may fairly assume that they acted with the best intentions, but the result is not necessarily happy for the mother, for the child or for the community. Beddie and Osmond point out the great difference that there is between this situation and the death of a newborn child. Death is provided for in the customs, the *mores*, of our society; there are accepted ways of facing it (with "condolences, flowers, the priest or parson, the neighbours' sympathy") and there is the right to mourn. The present situation is different. "Rosebud is lost, but she is not dead. The mother's womb is empty, but there have been no funeral rites." Because she may not see her child, Rosebud's mother is bound to imagine her as something monstrous—which is, of course, not so. Beddie and Osmond quote another case, in which the parents, against their paediatrician's advice and in great trepidation, visited their mongoloid baby. They were pleasantly surprised. When the child died a few months later, they were glad for what they had done, took the dead child home, and buried and mourned him. "All was completed in decency and decorum. A child had been born, acknowledged, named, lived a little, and died." Rosebud's mother has none of this. She is doubly deprived—of her child and of her right to mourn; and such a situation is psychologically damaging, leaving the unacknowledged grief to find its expression in irregular ways.

From the social point of view, the placing of these children in institutions will, as it becomes an increasing practice, put a financial burden on the community with no clear evidence that it will do much good. It is apparently intended to save the mother pain, but it may in fact bring greater pain. It is not usually wise to pretend that life is more rosy than it is, or to organize it to be superficially that way. Beddie and Osmond quote George Santayana: "Life is not a spectacle or a feast, it is a predicament", and add, as their comment, "Those who try to deny this mislead not only themselves but those whom they try to help".

From the child's point of view, in its early, formative years there is no substitute for a mother except another mother. This is true of any child, but especially true of the mongoloid child if it is to achieve its limited potential. Probably some mentally defective children should be admitted to an institution, but selection must be careful if the best interests of everyone are to be served; "indiscriminate admission", write Beddie and Osmond, "can only result in defeating its own purpose—the reduction of unhappiness".

The views of Beddie and Osmond will not be conclusive to everybody, but they have done a service in relating to this problem the *mores* and laws—the approved ways developed by human societies of meeting the various predicaments which constitute life. As they state, nothing from birth to death is unaffected by these *mores*. "A mother who has an idiot child has to meet this misfortune in the setting of our culture and must therefore, unless she is to alienate herself from our *mores*, respond to this misfortune in the way which our culture demands." This is not always compatible with the zeal for social antisepsis which would sweep all such "harmless but ineffective citizens" into isolation.

#### ANOTHER APPROACH TO THE TREATMENT OF BURNS.

RECENT YEARS have seen a number of advances in the treatment of burns, and the popularity of one method after another has waxed and waned, sometimes to wax again. One of the major problems has been the control of infec-

tion, and the advent of the antibiotics meant a decisive step forward in this regard. In these columns early in 1955 attention was drawn to a critical investigation by E. J. L. Lowbury, D. J. Crocket and D. M. Jackson<sup>1</sup> of the exposure method, particularly in relation to bacterial growth. These workers pointed out that one of the chief arguments in favour of the exposure treatment—alleged protection against pathogenic organisms—was not supported by their study. They concluded that both the open and the closed methods of treatment had a place, and that the open method was often indicated on clinical grounds or because adequate cover with dressings was impossible. A different approach is presented by G. Ménégaux and Ph. Détrie,<sup>2</sup> who in a small series of cases have tried the local application of crystallized trypsin in the treatment of burns. All the burns were of second or third degree. The first three cases are reported in some detail, but in this place it will be sufficient to give some account of the first—that of a man, aged forty-seven years, who had received second or third degree burns affecting the left thigh and leg. There was a delay of fifteen days between the time of receipt of the burns and the institution of treatment with trypsin; the burnt surfaces were at that time covered with the usual hard crust. His knee was treated first with dressings of trypsin in Sorensen's solution, applied at 9 a.m., 12 noon, 3 p.m. and 6 p.m. During the night the burnt surfaces were kept covered with serum. There is no mention of the use of antibiotics at any time. After three days of treatment all the necrosed tissue had disappeared, and had been replaced by a smooth surface undergoing spontaneous epidermization. On this day it was decided to extend the treatment to the thigh, and a similar result was obtained. One week later the knee had healed, healing of the thigh was proceeding satisfactorily, and the burn on the leg was still covered by the usual hard crust. Trypsin treatment was then extended to the calf, and after five days the condition of the burnt area was much improved, the crusts had disappeared and epidermization was in progress. At this stage the supply of trypsin ran out, and the thigh was grafted nineteen days later. The knee and the leg healed without grafts. The patient left hospital in excellent condition two months later.

Encouraged by this result, Ménégaux and Détrie tried the method on four other patients, and the effect was equally gratifying. A sixth patient was so badly burnt as to require to be handed over to a special burns unit. They comment that crystallized trypsin has a favourable action on the necrosed tissues, which become smooth and free from crusts. Although trypsin has no bactericidal action, curiously enough the damaged areas do not become infected; the abolition of suitable culture media seems to be the only explanation. Under trypsin treatment, all the second degree burns in the small series were epidermized within the short space of four or five days. Third degree burns did not heal more quickly by this method, but they were ready for grafting much earlier, and the grafts took satisfactorily. There were no toxic effects and no local or general reaction. A further observation made was that, much more frequently than had previously been thought, burns were of second and not third degree. It was surprising to find widely sloughing surfaces covered with epidermis in a few days. By preventing infection, trypsin protects the burn and prevents it from deteriorating from the second to the third degree through destruction of the remaining small patches of epidermis.

One minor criticism of this work is that no indication is given of the treatment that the patients received in the period between their being burnt and the inception of trypsin treatment; it would be interesting to know this. However, Ménégaux and Détrie have presented a simple statement of their experience of this method in a few cases, and have avoided making spectacular claims; they suggest that the procedure should be more widely known. Perhaps further trials will be carried out in other centres.

<sup>1</sup> M. J. AUSTRALIA, January 22, 1955.

<sup>2</sup> Presse méd., October 12, 1955.

## Abstracts from Medical Literature.

### DERMATOLOGY.

#### Elephantiasis Nostras Verrucosa.

P. L. DAVIS (*Arch. Dermat.*, May, 1955) states that a patient treated herself with a preparation of phenol and camphor for athlete's foot, affecting the left foot. After one application she developed a severe erysipelas-like infection with lymphangitis extending from the toes to the groin, chills and fever. The severe inflammation resulted in lymphoedema. As the years progressed verrucous changes appeared which incapacitated the patient. After many futile attempts at treatment by medical and surgical means, amputation was performed.

#### Staining of the Fingernails by Resorcinol.

A. B. LOVEMAN AND M. T. FLIEGELMAN (*Arch. Dermat.*, August, 1955) report that controlled experiments showed that alcoholic preparations of both resorcinol and resorcinol monoacetate may produce a yellowish-orange discolouration of the fingernails when the nails are lacquered. It is suggested that when preparations containing resorcinol are prescribed, patients should be cautioned against the possibility of staining in this way.

#### Erythema Marginatum.

J. B. BURKE (*Arch. Dis. Childhood*, August, 1955) presents reports on 19 patients with *erythema marginatum* (or, alternatively, *erythema annulare*), 14 of whom had rheumatic fever and five of whom did not. Moreover, in the 14 with rheumatic fever, the skin condition persisted long after the evidence of the fever had disappeared; salicylates, cortisone and ACTH had no effect on it. The author concludes that *erythema marginatum* is a non-specific condition not related to rheumatic fever.

#### "Freon" for Anesthesia in Skin Planing.

J. J. ELLER (*New York State J. Med.*, August 15, 1955) advises the use of "Freon Mixture" or "Freon 114" sprays instead of ethyl chloride for anaesthetizing and stiffening the skin during surgical skin planing. "Freon" is a non-combustible, non-explosive refrigerant which is also non-toxic and non-irritant, and has no general anaesthetic properties, and as it has effects identical with those of ethyl chloride as a refrigerant local anaesthetic, its use is equally satisfactory and infinitely safer.

#### Pigmentation of Diencephalic Origin.

V. J. DERBES, G. FLEMING AND S. W. BECKER (*Arch. Dermat.*, July, 1955) state that several types of intracranial disease may cause generalized cutaneous pigmentation, without there being any abnormality of the adrenals; four patients with Schilder's disease reported in the article had pigmentation; schizo-

phrenia, encephalitis, Fanconi syndrome and hepato-lenticular degeneration, among other conditions, are occasionally accompanied by pigmentation. The authors suggest that the common factor is probably the melanocyte-stimulating hormone of the *pars intermedia* of the pituitary gland; production of this hormone may be stimulated by various factors, resulting in overactivity of melanocytes. Alternatively, since adrenaline and noradrenaline inhibit melanocytes, a decrease in production of ACTH would result in a decrease in production of hydrocortisone with reduced inhibition of melanocytes. The authors discuss various conditions which they explain on the basis of this hypothesis.

#### Scleroderma and Dermatomyositis.

G. B. DOWLING (*Brit. J. Dermat.*, August-September, 1955) discusses the terminology of scleroderma. He states that confusion would be overcome if only two terms were used: scleroderma and morphea, classified as localized and widespread. When atrophic sclerosis of the skin occurs in conjunction with generalized myositis, notwithstanding that several names have been coined to describe variations of this condition, he recommends the use of the term dermatomyositis only. He then reviews the clinical and pathological features of scleroderma, describing in detail the effects in the alimentary canal, arteries, kidneys, lungs, thyroid gland, teeth and muscles. He considers that by now the clinical and pathological picture of scleroderma is complete; but of its aetiology nothing is yet known, and even its classification as a diffuse collagen disease is open to doubt. The diagnosis of dermatomyositis is not so easy. The rash is usually characteristic, but variations occur; it is in its distribution that it is most constant. The myasthenia which accompanies the skin manifestations is of varying degrees, but is always present. The author's description of these two conditions gives the final impression that they are almost identical, with the muscular effects minimal and subclinical in scleroderma, but prominent in dermatomyositis. However, he states that it is wiser to regard them as different diseases. He next discusses the frequency with which dermatomyositis is associated with visceral malignant disease, and concludes with a brief mention of morphea, which has much the same type of skin lesions but none of the visceral lesions.

#### Patch Tests in Eczema and Dermatitis.

H. T. H. WILSON (*Brit. J. Dermat.*, August-September, 1955) reports on investigations to determine whether more positive skin reactions to patch tests can be obtained in eczematous subjects than in normal controls, and whether such positive skin reactions indicate true epidermal allergy or merely a non-specific state of increased reactivity. Ten reagents were tested on groups of 50 patients with eczematous contact dermatitis due to various agents, with diskoid eczema and with atopic eczema, and on 50 normal subjects. The results indicated that patients with ecze-

ma showed more positive results than did normal subjects, those with contact dermatitis showing the greatest number, but many of the reactions were merely irritation phenomena, not true sensitization reactions. However, the threshold of reactivity was definitely lower in the eczematous patients, varying with the phases of the eczema.

#### Thrombocytopenic Purpura after Treatment with Trinitrin.

J. SHMUSHKOVICH AND E. DAVIS (*Brit. J. Dermat.*, August-September, 1955) report the development of an erythematous, purpuric rash on the legs and buttocks of a patient who was taking trinitrin for the treatment of angina of effort following myocardial infarction. His blood platelet count was very low. When the trinitrin was discontinued, the rash faded and the numbers of platelets rose; readministration of trinitrin produced thrombocytopenia again.

#### Antibiotics and Herpes Simplex.

R. G. MACKNESSEN AND H. L. ORMSBY (*Am. J. Ophth.*, May, 1955) studied the effect of various broad-spectrum antibiotics on *herpes simplex* virus *in vitro*. Their experiments suggest that "Aureomycin" is the antibiotic of choice when one wishes to use such a drug in the treatment of *herpes simplex* infections.

### UROLOGY

#### Cinefluorography of Bladder and Urethra.

J. A. BENJAMIN *et alii* (*J. Urol.*, March, 1955) state that previous workers in the fluoroscopic study of micturition have called attention to the deliberate relaxation of the muscles of the pelvic floor which precipitates the reflexes of micturition, and the wilful contraction of these muscles which causes cessation of the stream. As well as the action of the external urethral sphincter, the same authors drew attention in 1949 to the important role of the pubo-coccygeus muscle in stopping and starting urination. In this cinematographic study, 30% "Urokon" solution was used as the contrast medium, and 15 individual exposures were made in each second of exposure. The total time of exposure was about twenty seconds; during this period the patients interrupted urination and started again. They also had to strain at urination. It was observed that if the bladder neck was once opened to permit the fluid to enter the urethra, even though the patient stopped and started again, the bladder neck did not close again. The shut-off of the stream was seen to be at the level of the external urethral sphincter. In the inactive phase before urination the bladder neck was closed and the bladder floor flat. During the active phase of urination the bladder descended and its base became cone-shaped. Then, when the stream was stopped, the cut-off was always seen to occur at the level of the external sphincter. The segment of urethra obliterated in the region of the external sphincter appeared quite long. The authors agree with Mueller that it is likely that the pubo-coccygeus muscle shares in this cut-off mechanism. Cinefluorography should be

used to study such problems as stress incontinence, incontinence after bladder and prostatic operations, and neurological vesical disorders.

#### Tumours of the Testis.

S. L. RAINES AND T. G. HURDLE (*J. Urol.*, February, 1955) have made a study based on 50 cases of malignant testicular tumour treated in a returned servicemen's hospital between 1947 and 1953. The important feature was that after orchidectomy, with transection of the spermatic cord at the level of the internal ring, irradiation of the glands was carried out by million-volt X-ray therapy. There are very few reports in the literature of results obtained by this method. Two of the patients in this series of 50 had bilateral tumours. The authors were able to make a follow-up investigation of 47 patients. Of these 47 it has been found that 68% are still alive. If the patients are divided into three main groups, it is seen that 86% of those with seminoma, 53% of those with embryonal carcinoma and 55% of those with teratocarcinoma are alive. Compared with reported results from other methods of treatment, this is a very good result, particularly in the two more malignant categories, seminoma being relatively innocent. The use of excretory urography is emphasized in revealing the presence of early metastases in the peri-aortic lymph glands by distortion or obstruction of the ureter. Follow-up urographic studies are most useful in the determination of whether or not these metastatic masses are radiosensitive; if they are, the displacement of the ureter is seen to diminish, and any obstruction to the duct tends to disappear as the metastatic deposit shrinks.

#### Eleventh Rib Approach to the Kidney.

L. M. WOODRUFF (*J. Urol.*, February, 1955) states that a certain proportion of kidneys needing operation are situated rather high up under the "thoracic cage", and therefore call for a much higher approach than the classical sub-costal one. The twelfth rib incision has been most useful for this purpose; but where the difficulties are likely to be very great, the eleventh rib incision will be found an improvement, especially as here again one keeps below the pleura with just a little care. The periosteal stripping is begun well anteriorly, and is not carried posteriorly until it is well established. In this way the pleura will not be damaged. The rib is removed to just behind its angle. The anterior abdominal muscles are next transected to expose the peritoneum and the perirenal fascia. After the posterior part of the peritoneum has been incised, the diaphragmatic fibres crossing to the twelfth rib are seen in the eleventh rib bed, and the anterior pleural margin can be identified. The fibres of the diaphragm are incised, from before backwards, nearly to the pleural margin. By blunt finger dissection the pleura is freed from the posterior edge of the twelfth rib. After the pleura has been gently freed, it retracts up behind the tenth rib. Moist packs are then placed along the margins of the wound, and the self-retaining rib-

spreader is applied. If for any reason the pleura has been opened, and the sutured wound is not satisfactorily airtight, a small thoracotomy tube on water-seal or suction for forty-eight hours has been used to prevent pneumothorax. The increased width and height of exposure gained by this incision allows safe, easy dissection of the renal vessels; therefore individual ligation of renal vessels is possible, this being a better surgical method than en-masse ligation. The view obtained of the upper pole also allows careful dissection of the adrenal from the kidney; it also facilitates the operation of adrenalectomy.

#### Carcinoma of the Ureter.

G. F. WHITLOCK, J. R. McDONALD AND E. N. COOK (*J. Urol.*, February, 1955) have made a pathological study, with special reference to prognosis, of 33 cases of primary carcinoma of the ureter treated surgically at the Mayo Clinic up to 1945. A workable classification is given, and this has a practical prognostic significance. Of the tumours 55% were purely papillary in structure, 29% were papillary and infiltrating, and 16% were non-papillary and infiltrating. Of the papillary carcinomas 82% were of a low grade of malignancy, but most growths in the other two categories were highly malignant. Of patients with a purely papillary carcinoma two-thirds lived for five years or more. Only one patient with an infiltrating carcinoma lived as long as three years, and he was not cured. At least one-half of the purely papillary carcinomas were associated with, or followed by, similar carcinomas in the bladder. The non-papillary tumours did not show this tendency. It is considered, from the evidence of this study, that the standard operation of complete nephroureterectomy, as practised today, is adequate and satisfactory for papillary carcinoma of the ureter. On the other hand, it is equally apparent that patients with infiltrating carcinoma are not being cured by the present methods. Whether or not more complete dissection of all regional lymphatics would offer a higher rate of cure remains to be seen.

#### Pre-operative Irradiation of Vesical Neoplasms.

D. H. HIGBEE (*J. Urol.*, March, 1955) states that radiation therapy has lost favour among urologists in the treatment of bladder tumours. Many of these are fairly radiosensitive, but the doses used are badly tolerated by the bladder itself. Therefore, most urologists have been content to reserve this form of therapy for use as a purely palliative measure in hopeless cases of bladder carcinoma, or as an attempted preventive measure against recurrence after diathermy or open operation. The author, however, now advises a special use of radiation which he has found of great value. This is to use it pre-operatively to cause reduction in size of single, or multiple, papillary tumours; later, one proceeds to cystoscopic diathermy removal by loop resection. It is commonly agreed that endoscopic resection is the treatment of choice for about 65% of accessible and predominantly papillary tumours; and

that statistics show the rate of cure for tumours so treated to be exceptionally high. The author therefore uses this method wherever possible, and reserves for open operation and more radical measures the more extensive malignant conditions. A moderately large papillary tumour overlying a ureteric orifice, with both the orifice and the tumour base obscured, can be reduced by judicious radiation therapy to one-half, or even one-third, of its former size. Then it can be removed with the endoscopic loop, without ureteric damage, even if part of the orifice has to be cut away. Multiple papillary tumours which defy diagnosis by cystoscopy and cystogram so far as their number and location are concerned, similarly can be reduced in size sufficiently for each one to be treated individually and adequately, even though as many as seven or eight may be present. The dose to be employed, whether produced by high voltage radiation or by radium emanation from a source in a Foley catheter, should be the maximum dose which is only mildly irritative to the bladder. This usually consists of a tumour dose of about 2500r, given through multiple ports over a period of about two weeks, followed by four to six weeks during which retrogression takes place. During the latter period, if cystitis occurs, infection can be kept under control by antibiotics. In 30 cases, in which treatment was carried out over a period of several years, no instances of bleeding required abandonment of the therapy before its completion.

#### Radon Seeds with Endoscopic Resection in Bladder Tumours.

J. L. EMMETT AND J. R. WINTERRINGER (*J. Urol.*, March, 1955) state that the five-year survival rate for partial and total cystectomy in cases of malignant vesical neoplasm is about 30%. Partial cystectomy appears to give results superior to those of total cystectomy. Degree of infiltration of the bladder wall is the most important factor in diagnosis, with microscopic grading of degree of malignancy next in importance. The results of endoscopic resection and radiation therapy are difficult to compare with those of partial and total cystectomy. Only by open operation can degree of infiltration and presence of metastases be determined. Nevertheless results in the literature suggest that endoscopic resection is probably more effective than open removal. A study was made at the Mayo Clinic of 118 cases in which radon seeds were implanted. In about three-quarters of these the implantation was performed cystoscopically, and in addition the tumour was removed either by endoscopic resection or by partial cystectomy. Although 46% of patients did not survive the first year, nearly one-third of 115 patients who could be followed-up survived five years or more, which is about the same percentage of five-year survivals as was reported in 1948 by McDonald and Thompson. As a result of their study the authors are inclined to feel, as did Barnes, Turner and Bergman in 1946, that combined endoscopic resection and implantation of radon seeds may merit more frequent use than it has been accorded in the past.

## Special Article.

### SPEECH THERAPY: ITS SCOPE AND ITS DEVELOPMENT IN AUSTRALIA.

It has been said that speech therapy, so far as Britain is concerned, was born in the 1914-1918 war, and it may with equal truth be stated that the profession came of age during the 1939-1945 war. In fact, the establishment and development of speech therapy as a medical auxiliary service in Britain and in Australia have taken place entirely in the present century. Although it is considered the youngest of the medical ancillary services, it holds a unique position, since it is the only branch of the speech sciences which is directly allied in an auxiliary capacity to the medical profession.

Today, more than ever before, there is a growing awareness of the need for treatment of both children and adults suffering from speech disabilities, and a recognition of the fact that such treatment should be in the hands of experts adequately trained to do this work. Speech therapy has taken its rightful place as a part of medical service, and there should no longer be any confusion—all too prevalent in the past—between the work of the teacher of elocution and the speech therapist. The speech therapist's aim is to help the patient to adjust his or her speech to as near normality as is possible, enabling the individual to feel at ease in speech situations within his or her own normal environment.

#### Scope of Speech Therapy.

Speech therapy has been defined as the remedial treatment of disorders of speech, voice and language. It is a medical auxiliary service, and qualified speech therapists will undertake the treatment only of patients who are referred to them by members of the medical profession. The following tabulation sets out the main speech disorders with some of their causative conditions.

#### SPEECH DISORDERS OF NEUROLOGICAL ORIGIN.

##### *Disorders:*

Dysarthria resulting from disease or lesion of some part of the central nervous system.

##### *Some Causative Conditions:*

Chronic encephalitis, post-encephalitic Parkinsonism, heredito-familial ataxia, thrombosis of the cerebral arteries, cerebral diplegia, cerebral haemorrhage, embolism.

See above.

Aphasia (dysphasia), alexia (dyslexia) and agraphia (dysgraphia), congenital or developmental, resulting from disease or lesion of some part of the central nervous system (dysarthria may also be present).

Aphonia or dysphonia resulting from disease of, or injury to, the neural mechanism of the voice.

#### SPEECH DISORDERS

##### *Disorders:*

Dyslalia, disturbances of articulate speech including sigmatism, gamicism, use of glottal stop, cluttering, delayed speech development, audimutitas.

Hyperrhinophonia, hyporhinophonia, aphonia and dysphonia.

#### Stammering (various types).

The practice of speech therapy involves more than the adjustment of the abnormalities of speech, and consideration of the treatment of any type of speech disorder should include careful study of the patient as an individual. For this purpose, it is quite often necessary to confer with one or more of what may be considered the appropriate therapeutic team. The personnel who have seen the patient and are concerned in the treatment could include one or more

of the following: the physician, the surgeon, the oto-rhino-laryngologist, the neurologist, the psychiatrist, the orthodontist, the psychologist, the audiometrist, the almoner or psychiatric social worker, the kindergartner or the school teacher. Although this is an age of specialization, it is a poor outlook for the individual if the narrowness of approach limits the pattern of treatment.

#### Development of Speech Therapy in Australia.

Realization of the need for the establishment of a specialized service for the treatment of speech disorders was applied in a practical manner when the first speech therapy clinic in Australia was pioneered at the Royal Alexandra Hospital for Children, New South Wales, in 1931. Sir Robert Wade was responsible for its inauguration, and Miss Elinor Wray, who received her training in England, was the Honorary Speech Therapist for the first seven years of its history. In 1934 liaison was established with the New South Wales Department of Education, through Dr. A. E. Machin, Principal Medical Officer of the School Medical Services, who carried out a survey of speech disorders in the metropolitan schools. This investigation showed that there was a large group in which education and personality would be seriously retarded if no treatment was available.

An arrangement was made for visiting medical officers to refer school children with speech disorders to the Royal Alexandra Hospital for Children speech therapy clinic. This clinic developed rapidly, and in 1935 Dr. D. W. H. Arnott became the Honorary Medical Officer in charge of the Child Guidance Clinic, to which the speech therapy clinic became affiliated. By the end of 1936 heavy demands were being made on this clinic from within the hospital and other sources as far afield as Tasmania and New Zealand. As Miss Wray was then the only practising speech therapist in Australia, it became a problem of urgent necessity that some provision be made for the training of speech therapists in Australia. In February, 1936, the first training course came into operation under the guidance and administration of an Advisory Council.

Early in 1939 the South Australian Education Department wisely decided that the appointment of lecturer in speech education and correction at the Adelaide Teachers' College should be held by a speech therapist; therefore it was arranged that the appointment would include the lecturing work as well as the clinical work. A survey of 69 schools was made, and it was decided to treat stammer and cleft palate only. During the war years the work increased, and now all types of disorders are treated.

In Western Australia, early in 1939, Dr. Ralph Crisp, Honorary Pediatrician to the Children's Hospital, Perth, convinced the Board of Management that post-operative cleft palate patients required special treatment for associated speech difficulties, and that it should be part of the hospital service. The hospital authorities agreed that provision should be made for the treatment of all disorders of speech, and a part-time appointment was made available at the Children's Hospital, Subiaco (now known as the Princess Margaret Hospital for Children).

At the Children's Hospital, Melbourne, Victoria, in 1943, it was found that many children who attended the psychiatric clinic suffered from speech disorders. Mrs. Olive Cherry, who was English trained and qualified, was appointed as Honorary Consultant Speech Therapist to the Children's Hospital. Her recommendation to the Committee of Management of the Children's Hospital was that a council should be set up, and that under the guidance of this council the College of Speech Therapists should be approached for advice in the appointing of a qualified speech therapist of seniority to undertake the inauguration and administration of speech therapy at the Children's Hospital, Melbourne, and also to establish and direct a course of training. A Provisional Council for Speech Therapy was established in 1944. On this council there were representatives of the University of Melbourne, members of the honorary medical and surgical staffs of the training hospitals, and representatives of the Education Department and the Red Cross Society (Victorian Branch). An appointment was advertised throughout Australia and the United Kingdom, and in 1945 Miss Margaret Badcock was appointed and brought out from England for the dual position of Speech Therapist to the Children's Hospital, and Director of Training for the Provisional Council of Speech Therapy. The initial course of training in Melbourne and Sydney was based on the current English syllabus, which made provision for a course of two years' duration.

In 1948 the Australian College of Speech Therapists was established as the qualifying and examining body as well as

the representative body for the profession, replacing the Australian Association of Speech Therapists which had been formed in 1944. The constitution of this College was based upon that of the parent body—the College of Speech Therapists, London—and reciprocity between these two Colleges was established; thus Australian qualified speech therapists were eligible to practise in the United Kingdom. Training courses for speech therapy are now being conducted at the Royal Children's Hospital, Melbourne, and the Royal Alexandra Hospital for Children, Sydney, provision being made for a three years' course of training. The syllabus includes lectures in orthophonics, phonetics, speech therapy, biology, anatomy and physiology, neurology, psychology, elementary acoustics, social science, plastic surgery, ear, nose and throat, paediatrics, and orthodontics and prosthetics in relation to speech therapy.

Speech therapy clinics are now established in all States of the Commonwealth. Clinics function in public hospitals, school medical services of education and health departments; and institutions and speech therapists are available for private practice. Hospital clinics are usually established in close association with the psychiatric, the ear, nose and throat, or the neurological department.

In December, 1953, as a result of the unanimous acceptance by all College members throughout Australasia of the Memorandum and Articles of Association, the Australian College of Speech Therapists was registered in Canberra as an incorporate body. Such Federal registration is indicative of the present professional status achieved by this College in a period of five years.

#### Summary.

The widening interest in development and recognition of the status of speech therapy is evidenced by (a) the increased number of clinics already established, (b) the indications that those clinical centres are requiring more therapists, (c) the fact that, at the present time, the demand for qualified therapists exceeds the supply, and (d) the achievement of early Federal registration despite variations in the problem in the different States.

GRACE ELLIS, F.A.C.S.T.,  
Past President, Australian College of  
Speech Therapists.

Sydney,  
September 22, 1955.

## British Medical Association News.

#### SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Royal North Shore Hospital of Sydney, Crow's Nest, New South Wales, on April 21, 1955. The meeting took the form of a series of clinical demonstrations by members of the medical and surgical staffs of the hospital. Parts of this report appeared in the issues of December 24 and 31, 1955, and January 7, 1956.

#### Cervical Osteomyelitis.

DR. A. R. HAMILTON showed two patients. A man, aged sixty-five years, had been admitted to the Royal North Shore Hospital of Sydney on November 26, 1954, with a history of pain on movement of the neck and cervical kyphosis of three months' duration. He also had pneumonia and was in a state of congestive cardiac failure. On examination he was found to have painful limitation of movement of the left shoulder and neck and kyphosis in the region of the fifth and sixth cervical vertebrae. He was placed in a Glisson sling with three pounds' traction and with a small pillow for support, and penicillin therapy was commenced. An X-ray examination of the cervical part of the spine on December 16, 1954, showed almost complete destruction of the bodies of the fifth and sixth cervical vertebrae and degenerative slipping of the other vertebrae. He was discharged from hospital on January 28, 1955, wearing a plaster of Paris collar.

#### Paravertebral Sarcoma.

A married woman, aged twenty-eight years, had been treated for tuberculous spinal caries for twelve years prior to her admission to hospital in 1950, when she was diagnosed as having diabetes insipidus. In 1953 she developed low back pain radiating down the left leg, and X-ray examination

showed collapse of the fourth lumbar vertebra. She was treated in a plaster of Paris jacket and later a Jones double abduction frame, but little relief was obtained. Later the pain increased in severity and loss of power in the left leg was detected. There was wasting of the quadriceps with decreased knee jerk. Exquisite tenderness was elicited on percussing over the spine of the fourth lumbar vertebra. She was unable to walk. X-ray examination showed further collapse of the fourth lumbar vertebra, and a myelogram on June 23, 1954, showed spinal block at the level of the third and fourth lumbar vertebrae. On June 28, 1954, at operation an anaplastic sarcoma arising from the paravertebral muscles overlying the fourth lumbar vertebra was removed. The patient had a post-operative course of deep X-ray therapy for several weeks.

#### Wilms Tumour of the Kidney.

DR. ALBAN GEE presented a boy, aged two and a half years, who had been admitted to hospital with haematuria of one week's duration. He had no urinary symptoms, and no relevant past history. There was no loss of weight, and his appetite was good. When the boy was first examined, a mass could be felt in the right side of his abdomen, which could have been either renal or hepatic in origin. During the week in which further investigations were being carried out, this became more clearly defined and definitely renal. At cystoscopy no bleeding was found, but right retrograde pyelography revealed well-marked depression and distortion of the upper calyces, and an enlargement of the upper pole shadow. At operation the lower pole was exposed first, and it was possible to ligate the pedicle before the upper pole and tumour were exposed. There was thus no risk of dissemination of malignant cells by handling. The pathology report confirmed the diagnosis of Wilms tumour, and a course of deep X-ray therapy was commenced ten days after operation as soon as the wound was healed.

Dr. Gee mentioned that, although well known, Wilms tumours were relatively rare. They were very sensitive to deep X-ray therapy, and this given before the operation would considerably reduce the size of the tumour, making operation easier with less handling. However, it would not effect a cure. In the case under discussion it was thought that the growth was early, and that removal would not be difficult. The prognosis was depressing, and was said to be worse when haematuria was present. However, in the present case the boy was now very well indeed six months after operation; and if he survived the next six months, he should have a good chance.

#### Diverticulum of the Female Urethra with Stones.

Dr. Gee then presented a woman, aged fifty-four years, who had been referred by a gynaecologist with the diagnosis of bladder carcinoma. There was a history of haematuria ten months previously, and more recently frequency of micturition with scalding. Six years previously she had had a hysterectomy performed. Vaginal examination disclosed a hard area in the region of the trigone with crepitations. That finding was confirmed with the patient under anaesthesia when cystoscopy was performed, and a diverticulum containing stones was diagnosed, probably arising from the bladder. The trigone mucosa was very injected and roughened with adherent phosphatic deposits. At operation the diverticulum sac was removed and the narrow neck which was found to arise from the urethra was ligated. Four stones were obtained, each about one centimetre in diameter. Microscopically the sac was found to be lined by squamous epithelium, and it was thought to be a derivative of Gaertner's duct.

In discussing the case Dr. Gee pointed out that urethral diverticulum in the female was uncommon, and rarely contained stones. The operative approach was vaginal, but the patient was in the reversed lithotomy position. That posture had become popular in some American urology centres in the treatment of vesico-vaginal fistulae, and Dr. Gee had been most impressed with the good exposure obtained and the ease of working in a natural downwards direction.

#### Ureteric Stricture with Internal Iliac Artery Thrombosis.

Dr. Gee next presented a man, aged sixty years, who had sustained a heavy crushing injury while at work. There had been testicular bruising, and later epididymitis with some haematuria. Because of the bleeding, urological investigation was carried out. When seen in consultation the main complaint of the patient was of pain to the left side and above the pelvis, which went through to the back over the left sacro-iliac joint. It had been present only since the accident

nearly three months previously. At cystoscopy no abnormality was found except a heavy blood-stained efflux from the left ureteric catheter. Right pyelography disclosed two small stones in the right kidney. On the left side there was an area of obstruction in the ureter at the pelvic brim, with dilatation above and complete delay in emptying. An excretion urogram confirmed that finding. As no stone could be seen, and bleeding had been produced on that side, it was thought that a ureteric tumour might be present. The other possibility was a stricture from an extrinsic cause such as fibrosis from trauma at the accident. At operation an enlarged tortuous external iliac artery was found, which left the pelvic wall with each beat. It was followed to its origin, and the internal artery was located. At first the vessel was mistaken for the ureter, as it had only the faintest pulsation, with a hardened area in it suggestive of stone. The ureter was then located on the reflected peritoneum and when freed was found to have a narrowed area corresponding in position to the palpable lump felt in the artery. The latter was almost completely thrombosed. The ureter was opened and dilated, but apart from the stricture no abnormality was found. The only explanation appeared to be that trauma at the injury, known to be severe, had caused thrombosis of the internal iliac vessel and peri-ureteric fibrosis. A check excretion urogram three months later showed some dilatation still, but much better drainage at that level.

## Medical Societies.

### PÄEDIATRIC SOCIETY OF VICTORIA.

A MEETING of the Paediatric Society of Victoria was held at the Royal Children's Hospital, Melbourne, on June 8, 1955.

#### Dental Caries and the Fluoridation of Water.

The meeting opened with the showing of a film entitled "Drop in the Bucket". This was an American film concerning the part that fluoridation of the water supply of a community could play in dealing with the problem of dental caries.

After the film, DR. L. R. WILLIAMS, of the Australian Dental Association, discussed the problem briefly and answered questions. He said that one of the points that emerged from the film was that there was an overwhelming opinion in America in favour of the fluoridation of water, and only a minority of opinion that the long-range effects of this were not sufficiently proven. After the addition of fluoride to water in some areas for ten years, and amongst people living in areas where the water contained enough natural fluoride, no ill effects had been noted. In Australia the National Health and Medical Research Council, the British Medical Association and the Australian Dental Association had approved the findings. In Melbourne it had been estimated that the cost of adding fluoride to drinking water would be one shilling and threepence per person per year. In country centres the cost would be somewhat higher. The water in Melbourne contained 0.2 part per million of fluoride—in other words, one-fifth of the optimal amount.

DR. H. WILLIAMS asked Dr. Williams whether he could explain why the Australian aboriginal, who lived off the land, had very little dental caries. Where did he get his fluoride?

Dr. Williams, in reply, said that it was not contended that caries was a deficiency disease, and the addition of fluoride did not do away with the necessity for good dental hygiene and the avoidance of huge amounts of synthetic carbohydrate foods. Fluoridation would not completely abolish caries.

DR. D. HAGGER asked whether Dr. Williams could refer him to publications giving the evidence that in America there was a difference in the rate of caries when fluoride was added to water.

Dr. Williams mentioned that there was an excellent summary of the whole question made by the United Kingdom Mission report in 1952.

DR. D. STEPHENS asked whether the fluoride could not be given in some other way than in the water supply.

Dr. Williams said that soluble tablets had been advocated, but it would be very difficult to control strictly the taking of tablets. Addition of fluoride to milk or salt had also been suggested, but neither of the methods was practicable. All other substances were subject to more variation than drinking water.

DR. MARY LANE asked whether in any parts of Victoria the concentration of fluoride in water was high enough.

Dr. Williams said that in Nhill and Kaniva there was one part per million of fluoride in the water. Generally speaking the concentration was higher in the Mallee, but most people used tank water for drinking purposes as the water supply was unpalatable for other reasons.

DR. H. SINN asked what was the theory of action of fluoride.

Dr. Williams said that no one knew the answer to that question. It had been postulated that it was concerned with the enzyme system that broke down carbohydrates to acids, or that it made the tooth harder and more resistant to decay.

DR. V. COLLINS asked what provision was to be made for the people who used tank water as drinking water.

Dr. Williams said that the addition of fluoride would affect only those on a piped water supply. Fluoride supplements in other cases would have to be in the form of tablets. Topical application had been used to a certain extent. At the ages of three and a half, seven, ten and thirteen years a 2% solution of sodium fluoride was applied to the teeth. A 40% reduction in caries had been reported, but the method was much more expensive and not as lasting and was not advocated now. With fluoridation of water a 65% reduction in caries was obtained. Only half the population of America was on a piped water supply, but in Victoria 75% of the population of the State could be reached with fluoridation.

DR. H. WILLIAMS asked whether a trial in certain towns was intended in Victoria.

Dr. Williams, in reply, said that it was not proposed to carry out field studies, as those had already been running in America for ten years. However, fluoride would not be added indiscriminately to the water supply. It was proposed to carry out a thorough examination of children's teeth before its addition, and each year or so over a period of time there would be a constant check on the development of caries, and also on overdosage. When the concentration was one part per million, 10% of children had a very mild mottling of teeth which only the trained eye could detect. If that went up to 15%, then the concentration was too high. At the same time it was proposed to check the concentration medically by, for instance, urinalysis, which was a delicate means.

DR. V. COLLINS asked whether there was a high concentration of fluoride in tea. Dr. Williams said that in well-brewed tea there was one part per million of fluoride. The concentration of fluoride in fluids could go up to 4.7 parts per million before there was any demonstrable storage of fluoride in the body. Therefore one and a half litres of water per day would supply 1.5 milligrammes of fluoride per day, and that in addition to the amount of tea drunk would not lead to any storage effects. In children tea would be of no significance.

#### Management of an Epidemic of Acute Infective Enteritis of the Newborn.

DR. F. FORSTER read a paper prepared by himself and DR. J. LAVER on the management of an epidemic of acute infective enteritis of the newborn (see page 57).

DR. H. WILLIAMS opened the discussion by remarking that the problem had posed itself to the late Sir James Spence during the war, when the Princess Mary Maternity Hospital, Newcastle-on-Tyne, had been moved to an old orphanage, and the staff had been greatly concerned at the large number of cases of gastro-enteritis and other infection that occurred. Sir James Spence collected figures for one year and then instituted "rooming-in" and bottle feeding under the control of a paediatrician. There was no gastro-enteritis during the following two years, and infections of other types were greatly reduced.

DR. JUNIS PASH said that the Queen Victoria Memorial Hospital had been trying "rooming-in" for four and a half years with the exception of two nurseries, the premature babies' nursery and the observation nursery. They had had no major or minor epidemics of gastro-enteritis in the wards in which "rooming-in" was allowed, but there had been minor outbreaks in the other two nurseries.

DR. J. PERRY stressed the importance of continuing to pay great care to the prevention of the spread of infection by other precautions, and hoped that too much reliance would not be placed on "rooming-in" as the chief method of preventing outbreaks of infection.

DR. H. McLORINAN said that he was interested in the explosive nature of the epidemic. In three days there were

nine babies with infection. He asked if the question of how the babies were fed had been investigated, for the source of the epidemic would seem to be in that investigation.

Dr. Forster, in reply, said that no common factor could be found, even right back to the delivery and the "sucking-out" process. Four out of five nurseries had been affected. He said that it was Sir James Spence's work that first gave them the idea of tackling the epidemic in the way described. During the course of the investigation certain other things had been demonstrated, such as the saving of nursing staff in the hospital. "Rooming-in" had been practised on a restricted scale in two of the four wards in the hospital previously, but the babies went out at night to the nurseries. That was thought not to be enough now.

Dr. J. COLEBROOK said that there had been other outbreaks of gastro-enteritis at the Women's Hospital in the last ten years, but in the premature baby wards and not in the general wards as in the present instance. He asked whether Dr. Forster could supply any figures regarding the change in staphylococcal infections.

Dr. Forster said that of 163 babies, 12 had skin infection or sticky eyes. Of those, eight were cared for in the nursery and three were cared for by their mothers. Three of the cases in which sticky eyes occurred were in premature babies.

Dr. H. SINN asked whether in addition to "rooming-in" there was a limitation of visitors. He wondered whether respiratory tract infections would replace gastro-intestinal infections.

Dr. Forster said that the babies were moved outside the ward or to the centre of the ward, but they were not taken from their cots during visiting hours.

#### Staphylococcal Pericarditis.

Dr. M. ROBINSON (for Dr. S. WILLIAMS) presented the clinical details of a case of suppurative pericarditis with pericardial tamponade. Dr. Robinson said that suppurative pericarditis was now a medical curiosity. He had been unable to find an authoritative account of the subject since the advent of antibiotics, the only publications being those of isolated cases such as the one described. It would appear, however, that the principles of management of suppurative pericarditis were similar to those adopted in dealing with purulent exudates in other serous cavities, with the added complication of tamponade.

Dr. Robinson's case was that of a girl, aged six years, who had developed a slight cold with a cough one week before admission to hospital. However, she was well enough to attend school. On the day before admission to hospital she complained of a sore throat, and at school developed generalized abdominal pains. Her appetite was impaired, but she was thirsty. There were no significant features in her past or family history.

On examination of the child it was noted that she was pale and uncooperative with a temperature of 100.6° F., a pulse rate of 96 per minute and grunting respiration. The respiratory rate was 24 per minute. Both tonsils were large and reddened, and the cervical glands were enlarged and tender; otherwise the examination findings were normal. A provisional diagnosis of tonsillitis and cervical adenitis was made, and during the next forty-eight hours her general condition deteriorated, but no additional abnormal physical signs developed. During this period a microscopic examination of urine, lumbar puncture and Mantoux test were carried out; the results were found to be normal. From a "cough swab" a scanty growth of  $\beta$ -haemolytic streptococci was grown.

Forty-eight hours after the child's admission to hospital she suddenly became pale, cyanosed and dyspneic. The pulse rate rose to 180 per minute and the respirations to 45 per minute. There was jugular venous congestion, and the heart was enlarged as judged by percussion three-quarters of an inch outside the nipple line. It was not possible to localize the apex beat by palpation. The heart sounds were quite well heard, and there were no bruits. In addition, the liver could be palpated three fingers' breadth below the right costal margin, and it was also tender. The blood pressure could not be recorded accurately, but the systolic pressure was thought to be 80 millimetres of mercury. The peripheral circulation was very poor, the extremities being cold, blue and clammy. A diagnosis of congestive cardiac failure was made. Immediate X-ray examination of the chest showed that the heart was enlarged to the left, and the lung fields were clear apart from a minimal left pleural effusion. An electrocardiogram showed a sinus rhythm with a rate of 180 per minute. The S-T waves in leads I and II

were elevated, but the T waves were upright. These findings were compatible with pericarditis.

The child was digitalized, 0.5 gramme of digoxin being given intravenously, and placed in an oxygen tent. At this stage it was felt that she also had a pericardial effusion causing tamponade. Two hours later, despite full digitalization, she was much worse, and the pericardium was tapped. The needle was inserted into the fourth left intercostal space half an inch inside the nipple line, and 50 millilitres of purulent fluid were obtained. The jugular veins immediately collapsed. One million units of penicillin and 200 milligrammes of streptomycin were instilled into the pericardial cavity. In addition, parenteral administration of penicillin, in a dose of 2,000,000 units six-hourly, and erythromycin, in a dose of 150 milligrammes six-hourly, was commenced. Her general condition continued to improve, and next morning a pericardial friction rub could be heard to the left of the sternum. A blood examination at this stage showed a haemoglobin value of 78% and a white cell count of 38,750 per cubic millimetre; 90% of the white cells were neutrophile cells.

During that day the jugular venous congestion recurred, and 90 millilitres of cloudy fluid were obtained from the pericardial cavity, again with great improvement. On the following day another 50 millilitres were obtained, but the fluid was much thicker and more difficult to aspirate. At that stage it was thought that surgical drainage of the pericardium was indicated, and under general anaesthesia Dr. Russell Howard drained the pericardium through an abdominal incision. A good deal of straw-coloured fluid was aspirated during this procedure, but thereafter very little drainage was obtained. From the pus from the pericardium *Staphylococcus aureus* was grown sensitive to streptomycin, erythromycin and the tetracycline group. The organism was sensitive to ten units of penicillin per millilitre. Thereafter the patient's general condition slowly improved, and the drain tube was removed ten days later. The temperature at that time was still elevated, and a chest X-ray examination showed no decrease in the cardiac outline, the pleural effusion being, in fact, slightly increased. Flattened T waves in the electrocardiogram occurred and presumably represented myocardial involvement, which would explain the time taken for the heart to return to normal size. It was not until some two months later that the heart shadow returned completely to normal and another two months before a normal electrocardiogram was obtained. During that period her general condition was very good. Digitalis therapy was continued for five weeks and erythromycin therapy for almost that period, but administration of penicillin and streptomycin was discontinued after two weeks. Further convalescence was uneventful, and on the patient's discharge from hospital she was very well in all respects. No abnormal focus either in the chest wall or in the abdomen could be detected on repeated physical and radiological examinations. It was thought that the pericarditis was primary.

Dr. S. WILLIAMS said that Dr. Robinson deserved full credit for the management of the child. He had been helped a great deal by the astute reporting by Dr. Hiller on the electrocardiograms. Cardiac tamponade was not a condition with which one became familiar.

Dr. R. HOWARD said that the fluid removed at drainage was fairly clear and could have been aspirated. Surgical drainage in the present case probably did not achieve very much. The xiphisternum was removed during operation. He thought that the patient should be watched, as he had recently read a report of a case in which the patient developed constrictive pericarditis.

#### Testicular Tumours.

Dr. A. WILLIAMS gave a talk, illustrated with lantern slides, on testicular tumours seen in children. He presented brief clinical notes and morbid anatomical and histological findings of three examples of tumours involving the testis. He said that although malignant disease was not uncommon in childhood, tumours of the testis were rare. That rarity was borne out by a survey of the literature and also by the experience of the pathology department of the Royal Children's Hospital. Dr. Reginald Webster could recall only one example seen during his career as pathologist to the hospital. Only one testicular tumour had been removed in the period since 1948. That tumour, taken from a boy aged nine months, had the histological appearance of an adenocarcinoma, probably arising from the rete testis. After orchidectomy, the boy had been referred to the Peter McCallum Clinic, where a short course of deep X-ray therapy had been given. He was apparently quite well three years later.

Two further specimens were discovered by Dr. Williams. Those had been forwarded to him by Dr. Russell Howard. One, from an infant aged four months, was a solid tumour causing diffuse enlargement of the testis. It had grown rapidly in size prior to surgical removal. Histologically, a bizarre appearance was seen, and the mass was judged to be a developmental abnormality rather than of malignant nature. The infant was well two years after removal of the testis.

The third specimen presented clinically as a solid enlargement of testis in a boy aged six years. On section, however, a normal testis could be seen separate from the tumour, which, histologically, was a rhabdomyosarcoma of the spermatic cord. The child was well three months after operation.

DR. R. HOWARD said that the second patient mentioned by Dr. Williams was one referred to him from the country. The local doctor had removed the tumour and sent it to him. The child was four months old, and the tumour had been noticed for two months. The child was well twelve months later, but Dr. Howard had not heard about him since.

In the other child of six years, the tumour had been present for two to three weeks. There was no evidence of metastases, but it was ulcerating through the tunica at one place. Dr. Howard had removed the scrotal contents up to the inguinal ring, but there were no glands along the iliac vessels. He had discussed the question of radiotherapy with Dr. Kaye Scott, but the latter had been against it, as one would have to give enough irradiation to affect the right kidney and the growth of the lumbar vertebrae. The child was still being observed.

Gross had described twelve cases. He said that 75% of patients were well two to five years after removal of the tumours. Those that died did so within twelve months of operation. Dr. Howard said that surgery was only local excision and prophylactic excision of glands had been given up. Should extension occur, then deep X-ray therapy would have to be given, but that apparently was not without its ill effects.

#### Ellis-Creveld Syndrome.

DR. ELIZABETH TURNER presented the clinical details of a case of Ellis-Creveld syndrome. This will be reported in a later issue.

#### Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

#### THE FAUNA OF SYDNEY COVE<sup>1</sup>

[From the letters of Joseph Arnold, M.D., F.L.S.,<sup>2</sup> February 25, 1810.]

THE ground around Sydney is rocky and barren, very little growing but fruit trees. Within a little distance are woods of the loftiest trees I have ever seen and these continue for some hundreds of miles: the brushwood growing in some

<sup>1</sup> From the original in the Mitchell Library, Sydney.

<sup>2</sup> Joseph Arnold (1782-1818) was born in Beccles, Suffolk. Although he acquired a medical degree he preferred botany to medicine. He joined the Naval Medical Service and served for a time on H.M.S. *Victory*. He visited Sydney twice. He arrived there on December 30, 1809, in H.M.S. *Hindustan* which with H.M.S. *Dromedary* brought to New South Wales the 73rd Regiment who accompanied Lachlan Macquarie to his new posting. He left Sydney on May 12, 1810, with Governor Bligh on his return to England. In 1815 he returned on H.M.S. *Northampton* with a number of female convicts. He made daily entries in his diary which with his letters to his brothers contained *inter alia* very informative and critical comments on conditions in Sydney. On his second visit he was very coolly received by Governor and Mrs. Macquarie and had to make his own plans for his return journey. After a stay of three weeks he contrived to arrange a passage to England via Batavia on *Indefatigable*, which was destroyed by fire in Batavia. Whilst there he met Sir Stamford Raffles, who invited him to return there to assist in exploration. This he did in 1817, and subsequently with Raffles he discovered a plant, *Rafflesia arnoldi*, which has an enormous flower said to be one yard in diameter and to weigh fifteen pounds. He died of fever in Sumatra in 1818.

places so high as almost to prevent some persons from proceeding through them. The birds here are extremely beautiful, there being many kinds of parrots and other birds of the brightest plumage. The animals are very few. The only sort that are eatable are Kangaroos which sometimes weigh 200 lbs. Their flesh is something like hare and they make very good soup. I and some of our officers often go into the woods after birds, insects, or seeds. But the bushes are so thick as to be in many places impassable. At night also the mosquitoes are so thick as almost to make us mad with their bites. There are numerous nests of ants which are an inch long and whose bites are dangerous: centipedes and spiders as big as a man's hand. But what terrifies us most is that the country abounds in many kinds of dangerous serpents, the bites of which are instant death. As yet I have not met with any of these. My assistant however met with two, which they [sic] killed. One of them which he brought on board was as thick as my arm. One day we found a small poisonous serpent playing above the figurehead of the ship, which as soon as the people from the shore saw they made off, and would not return till it was knocked into the sea. My greatest diversion is to run among the woods and rocks: and also go fishing with lines and a net: at which we have great sport, catching great numbers of the most curious fish large and small.

#### Correspondence.

#### TOTAL ADRENALECTOMY AND OOPHORECTOMY FOR CARCINOMA OF THE BREAST.

SIR: I was interested to read the optimistic note struck by Dr. Cunningham in her excellent paper on this subject (M. J. AUSTRALIA, December 17, 1955), especially so in view of other less encouraging reports in the recent literature. I was a little disturbed, however, at the selection of patients recommended for an operation which is not entirely without risk.

Dr. Cunningham suggests that it is the treatment of choice for premenopausal women with "established metastases". There is, of course, a stage in the disease when such treatment should be considered, but an undiscriminating reader might deduce from Dr. Cunningham's paper that it was the first line of attack when metastases appear in a premenopausal female. I would prefer, however, to see a definite scheme of attack in the treatment of a patient developing recurrence or metastasis following radical treatment of the primary growth. The advantage of such a scheme is that the maximum benefit is gained for each stage before passing on to the next stage. On the other hand, if one commits oneself in the first place to total adrenalectomy and oophorectomy, there is no going back when the benefit that may have accrued for one or two years begins to disappear.

The scheme followed at the Peter MacCallum Clinic, Melbourne, which has been formulated after careful discussion is as follows:

1. Palliative irradiation alone is prescribed if the disease is localized (for example, first bone metastases or localized recurrence in scar or gland area), and it can be locally controlled for six to twelve months by this means.

2. Hormone therapy is the method of choice if metastases are disseminated, but this does not preclude use of palliative irradiation for urgent relief of symptoms (for example, pain from bone metastases, fungation of breast carcinoma *et cetera*). (a) Castration—surgical oophorectomy is favoured, but radiation may be used if the patient objects, or for other reasons. If there is no control after two to three months, or control is lost, proceed to (b) testosterone—*injection* or implant (at least 1200 milligrammes monthly of former, or 600 milligrammes monthly of latter). If there is no control after two to three months, or control is lost, proceed to (c) cortisone trial—start at 100 milligrammes reduced rapidly to 25 milligrammes daily. When control is lost, or if there is no control after four to six weeks, the tumour is probably non-hormone dependent, but one can consider (d) bilateral adrenalectomy.

It may not be generally known that X-ray therapy will relieve the pain of bone metastases within ten to fourteen days of treatment. If, as is often the case, such metastases remain solitary or few in number for six to twelve months, then that period of active pain-free life is the first of the increments to be obtained. The same applies to the X-ray

or radium treatment of axillary or supraclavicular glands or nodular recurrence in the scar. When, however, metastases are widespread, X-ray therapy is no longer feasible for all manifestations, but it can still be used to treat the ones causing symptoms while awaiting the slower relief which may be obtained by hormone therapy.

Dr. Cunningham has also ignored the increment of one to two years' useful pain-free life that can be obtained by the next step—that is, by castration alone. About 40% of pre-menopausal cases can obtain temporary control of metastases by either a surgical menopause (Schinzingher, 1889; Beatson, 1896; Thompson, 1902; Lett, 1905—to mention only the earliest reports) or by radiation menopause (Ahlbom, 1930; Dresser, 1936; Ritvo and Peterson, 1944; Halberstaedter and Hochman, 1946). Benefit is more marked in the case of bone metastases than in the case of lung, liver and brain metastases. This characteristic and the figure of 40% improvement is noted with practically every method of hormone therapy in breast carcinoma, indicating the proportion of hormone-sensitive cases.

Testosterone may now add six to eighteen months of active life in the case of a patient who has derived benefit from castration and, as Dr. Cunningham points out, often induces recalcification of bone metastases. She feels, however, that the side effects of the hormone do not justify its use. I have myself treated over 200 cases by the hormone and reported my first series in 1948 at the Royal Society of Medicine. In only one case did I meet a patient who insisted on discontinuing the hormone on account of increase in libido, and she was aged seventy. Hirsutism, seborrhoea and hoarseness are often scarcely noticed, and I have never heard that masculine characteristics entailed "argumentativeness". Given the choice, most of us will accept the use of a depilatory in return for an extra year of life.

Adrenalectomy should now yield a further one or two years of relief. Dr. Cunningham states: "I know of no means of estimating pre-operatively which patients will respond favourably." If she followed the scheme suggested, she would be in a position to prognosticate in the large majority the possible benefits from the operation. Relief following oophorectomy or testosterone therapy is generally followed by relief from adrenalectomy (West, 1952; Pearson, 1954). A case not responding to adrenalectomy will not, however, respond to hormones later (Huggins and Dao, 1953; Taylor, 1953); thus the order of the scheme suggested cannot be reversed if total adrenalectomy and oophorectomy are carried out in the first place.

Cortisone administration, although not capable of giving as good relief of symptoms as adrenalectomy, can be given a trial before the operation is considered. Firstly, it may lead to relief of symptoms for up to one year, and secondly, it will give an estimate of which case is likely to respond to adrenalectomy (Cooke, 1954).

My plea is, therefore, to attempt to gain an additional three to four years of life in the hormone-sensitive type of breast carcinoma by following a scheme of hormone treatment before embarking on bilateral adrenalectomy. In the case of the hormone-resistant type not responding to castration in the first place, then cortisone, oestrogens and hypophysectomy can be given a trial in that order.

Finally, I would like to quote Cade (1955): "Bilateral adrenalectomy is indicated when the disease is disseminated and no longer amenable to treatment by surgical, radio-logical and hormonal means."

Yours, etc.,

BASIL A. STOLI.

Melbourne,  
December 22, 1955.

#### CORTISONE AND FEMALE PSEUDO-HERMAPHRODITISM.

SIR: The Commonwealth Government provides cortisone free for a variety of conditions, among which female pseudohermaphroditism due to congenital adrenal hyperplasia is not included. My requests for free cortisone for two children with female pseudohermaphroditism made respectively on August 23, 1955, and October 30, 1955, and repeated since these dates have been acknowledged, but no decision has yet reached me regarding either case.

That cortisone can be life-saving or alleviate great distress in this condition cannot be denied. Its effectiveness has been pointed out by Dr. Vines and Professor Dods, writing from the Institute of Child Health, Sydney. Incidentally

the Institute receives government support through the Commonwealth Department of Health.

Surely the present situation of supplying free cortisone for common diseases when it is seldom necessary and withholding free supplies for a condition in which it is generally necessary is ludicrous.

Yours, etc.,

JAMES WATSON.

24 St. George's Terrace,  
Perth,  
December 28, 1955.

#### Post-Graduate Work.

#### THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

##### COURSE IN CANCER BY DR. GEORGE PACK.

The Post-Graduate Committee in Medicine in the University of Sydney announces that arrangements have been made for Dr. George Pack, Senior Surgeon of the Memorial Hospital, New York, and a noted authority on cancer, to give the following lectures at the Stawell Hall, 145 Macquarie Street, Sydney, at 8.15 p.m. on the following days: Monday, January 23, 1956, "The Problem of Gastric Cancer"; Wednesday, January 25, "Cancer of the Breast". In addition, arrangements have been made for Dr. Pack to give the following lectures at hospitals: Royal North Shore Hospital of Sydney, in the Students' Lecture Theatre, on Tuesday, January 24, at 2.30 p.m. "The Diagnosis and Treatment of Sarcomas of the Soft Somatic Tissues"; Sydney Hospital, in the Maitland Lecture Theatre, on Wednesday, January 25, at 11.30 a.m., "The Problem of the Pigmented Mole and Malignant Melanoma"; Royal Prince Alfred Hospital, in the Scot Skirving Lecture Theatre, on Friday, January 27, at 1.15 p.m., "The Management of Primary and Metastatic Cancers of the Liver".

The lectures have been arranged under a grant from the New South Wales State Cancer Council, and are open to all medical practitioners without fee.

##### ANNUAL SUBSCRIPTION COURSE.

##### Lecture by Dr. William M. Frye.

The Post-Graduate Committee in Medicine in the University of Sydney announces that the following lecture will be given by Dr. William M. Frye in the Stawell Hall, 145 Macquarie Street, Sydney, on January 18, 1956, at 8.15 p.m.: "Antibiotics in the Treatment of Amoebic and Bacillary Dysentery". Dr. Frye is Dean and Professor of Tropical Medicine of the Louisiana State University School of Medicine. He served on the United States Commission on Enteric Infections in Korea in 1951 as a special consultant of the United States Public Health Service, and is now a special consultant to the United States Public Health Service.

Further information may be obtained from the Course Secretary, Post-Graduate Committee in Medicine in the University of Sydney, 131 Macquarie Street, Sydney. Telephone: BU 4497.

##### PROGRAMME FOR 1956.

The Post-Graduate Committee in Medicine in the University of Sydney announces the following programme for 1956.

##### Overseas Lecturers.

Dr. Merrill Moore, who has been, until recently, Psychiatrist to the Boston City Hospital, is expected to visit Sydney early in January, 1956. Dr. Moore is noted as a fluent lecturer, with a considerable reputation in the United States as a sonneteer.

Dr. J. H. Sheldon, Director of Medicine and Senior Physician of the Royal Hospital, Wolverhampton, England, will visit Sydney in August, 1956, as the Official Overseas Lecturer.

Dr. M. Finkelstein, who is working for Professor B. Zondek's Hormone Research Department at the Hebrew University, Jerusalem, is expected to visit Australia in July-September, 1956.

Dr. C. Sosman, Radiologist at the Peter Bent Brigham Hospital, Boston, is expected to visit Australia towards the latter half of 1956.

#### Annual Subscription Course.

The annual subscription course covers attendance at lectures by overseas lecturers and other specially arranged activities. The annual fee is £2 2s. from July 1. The fee for resident medical officers is £1 1s.

#### Annual General Revision Course.

The annual general revision course will be held for two weeks from May 8 to 19, the main theme being "Therapeutics". Social activities will include a golf competition for the Post-Graduate Cup and for the Brydon Cup (for country competitors), a cocktail party and a theatre party. Fees for attendance are £12 12s. (full time) or £6 6s. (part time or for one week only).

#### Post-Graduate Oration.

The ninth annual Post-Graduate Oration will be given by Sir Herbert Schlink on "Sir Alfred Roberts and the Foundation of Royal Prince Alfred Hospital" during the annual general revision course on Wednesday, May 16, 1956, at 8.15 p.m. in the Great Hall of the University of Sydney.

#### Diploma Courses.

**Advanced Medicine.**—Courses in advanced medicine will be held from January 16 to April 7 and from June 11 to August 17. Fees for attendance will be £31 10s.

**Anesthesia.**—A Part I D.A. course will be held from September 3 to November 16. A Part II D.A. course will begin on June 11 for five months.

**Revision Course in Basic Medical Sciences.**—A revision course suitable both for practitioners anxious to revise their anatomy, physiology, biochemistry and pharmacology, and for those doing preliminary reading prior to undertaking diploma courses, will begin in March for a period of six months, consisting of lectures twice a week in the late afternoon.

**Dermatological Medicine.**—Provided five candidates are offering a Part I course in dermatological medicine will be held from May 21 to August 10, followed by a Part II course from August 20 to March of the following year.

**Primary F.R.A.C.S.**—Lectures for a primary F.R.A.C.S. course will be held in the late afternoon twice a week from March 5 to August 17.

**Gynaecology and Obstetrics.**—A Part I course for the D.G.O. will be held from September 3 to November 16 and a Part II course will begin on November 19 and continue until March, 1957.

**Laryngology and Oto-Rhinology.**—A Part I D.L.O. course will be held from September 3 to November 16, followed by a Part II course from November 19 until March, 1957.

**Ophthalmology.**—A Part I D.O. course will be held from September 3 to November 16, followed by a Part II course from November 19 until March, 1957.

**Clinical Pathology.**—A D.C.P. course will begin on July 16 for a period of seven months.

**Psychological Medicine.**—A Part I D.P.M. course will be held from March 16 to November 16. A Part II D.P.M. course will be held from June 18 to December.

**Diagnostic and Therapeutic Radiology.**—Part I D.D.R. and D.T.R. courses will begin on March 19 for four months, followed by Part II courses for both diplomas, which will continue until March, 1957.

All dates mentioned should be checked with the Committee, from whom copies of all university diploma regulations may be obtained.

#### Short Revision and Week-End Courses.

**Gynaecology and Obstetrics.**—An intensive course in gynaecology and obstetrics will be held at the Women's Hospital, Crown Street, Sydney, from August 13 to 24.

**Medical Statistics.**—A course of eleven lectures in medical statistics at weekly intervals will be held from June 5 to August 14.

**Pediatrics.**—A week-end course in pediatrics will be held at the Royal Alexandra Hospital for Children on August 4 and 5.

Subjects for week-end and other courses to be held include electrocardiography, neurology (early April), endocrinology, clinical laboratory methods, dermatology, early diagnosis of cancer, radioisotopes, diabetes (late April), gastro-enterology, rheumatic diseases (mid-June), psychiatry (early March), ophthalmology, ear, nose and throat, and tuberculosis.

Further details regarding dates of these courses will be announced shortly.

#### Country Courses.

Courses will be held in the following areas: Bathurst (April 21 to 22), Tamworth (June 2 to 3), Albury (September 1 to 2), Kempsey (September 15 to 16), Newcastle (October 27 to 28), Cooma (November 17 to 18), Wagga Wagga, Broken Hill, Katoomba, Hornsby, Lismore and Parramatta.

#### Instruction in Blood-Grouping Technique.

On application to the Committee, appointments for instruction in blood-grouping technique can be arranged, free of any charge, with the Red Cross Blood Transfusion Service in Sydney and with the Royal Newcastle Hospital in Newcastle.

#### Post-Graduate Residencies in Obstetrics and Gynaecology.

Post-graduate residencies in obstetrics and gynaecology are available from time to time at the Women's Hospital, Crown Street, Sydney, and at the Royal Hospital for Women, Paddington. Fees are £5 5s. per week, including board and residence. Early enrolment to the Committee is essential.

#### The Royal Newcastle Subsidiary Post-Graduate Hospital.

The Post-Graduate Committee in Medicine in the University of Sydney announces that it proposes to utilize the Royal Newcastle Hospital as a subsidiary post-graduate hospital and to introduce immediately the following courses:

**Anesthesia.** Practical training in modern methods of anaesthesia can be arranged either by daily attendance or in residence. Fees are £5 5s. per week, including board and residence.

**Obstetrics.** Resident post-graduate training in obstetrics can be arranged over a desired period, the fees being £5 5s. per week, including board and residence.

It is desirable that all applications be made well in advance, and that the period and type of training desired be stated. Applications must be addressed to the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney.

#### Instruction in the Technique of Post-Mortem Examination in Sydney.

Instruction in the technique of the performance of post-mortem examinations can be arranged with due notice on application to The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney. No fee is charged for this instruction.

#### Overseas Bureau.

The Committee maintains an overseas bureau to assist medical practitioners proceeding abroad, and at present is able to make arrangements in the United Kingdom, the United States of America and, to some extent, Italy. A fee of £2 2s. is charged for this service. Advice can be given concerning courses, accommodation, qualifications for registration and other matters.

#### Method of Enrolment and General Information.

In all cases, application for enrolment in post-graduate courses should be made to the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney. All fees are payable in advance. Telephones: BU 4497-8. Telegraphic address: "Postgrad Sydney."

#### Lectures at Balmoral Naval Hospital.

The Post-Graduate Committee in Medicine in the University of Sydney announces that a programme of lectures will be given at the Balmoral Naval Hospital, Balmoral, Sydney, during the first half of 1956. All lectures will begin at 2 p.m., and medical practitioners and senior medical graduates are invited to attend. The dates, subjects and lecturers are as follows: Tuesday, February 14, "Early Manifestations of Nervous Disorders", Dr. John McGeorge; Tuesday, March 13, "Common Diseases of the Genito-Urinary

Tract", Dr. Malcolm Earlam; Tuesday, April 10, "Present-Day Use of Antibiotics", Dr. A. W. Morrow; Tuesday, May 15, "Post-Operative Management of Some Surgical Conditions", Dr. E. A. Hedberg; Tuesday, June 12, "Asthma", Dr. Innes A. Brodzik. The programme for the remainder of 1956 will be issued at a later date.

## Public Health.

### POLICE OFFENCES (AMENDMENT) ACT, 1908, OF NEW SOUTH WALES.

THE following notice is published in the *New South Wales Government Gazette*, Number 150, of December 30, 1955:

It is hereby notified, for general information, that under the provisions of Regulation 25 of the Police Offences (Amendment) Act, 1908, as amended, the authority of Dr. Farrell John Reynolds to be in possession of drugs to which the Act applies for the purpose of his profession and to issue prescriptions for such drugs is withdrawn as on and from 16th January, 1956.

C. A. KELLY.

Chief Secretary's Department, Sydney, 30th December, 1955.

## Research.

### EXPERIMENTAL RESEARCH INTO PROBLEMS OF AGING.

CANDIDATES wishing to submit entries for the 1955-1956 Ciba Foundation Awards for papers descriptive of research relevant to basic problems of aging are reminded that these

must reach the Ciba Foundation not later than February 10, 1956. Information about the awards, for those not already aware of the conditions, may be obtained on application from G. E. W. Wolstenholme, Director, and Secretary to the Executive Council, Ciba Foundation, 41 Portland Place, London, W.1.

## Naval, Military and Air Force.

### APPOINTMENTS.

THE following appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 65, of December 15, 1955.

#### NAVAL FORCES OF THE COMMONWEALTH.

##### Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

*Extension of Retiring Age.*—The retiring age of Surgeon Captain James Martin Flattery, O.B.E., is extended for a period of two years from 2nd November, 1955.

##### Citizen Naval Forces of the Commonwealth.

##### Royal Australian Naval Reserve.

*Appointments.*—Frank Fisher and Lyle Munro are appointed Surgeon Lieutenants, dated 16th August, 1955.

#### AUSTRALIAN MILITARY FORCES.

##### Citizen Military Forces.

##### Northern Command.

*Royal Australian Army Medical Corps (Medical).*—The age for the retirement of 1/59168 Major (Honorary Lieutenant-Colonel) R. K. Wilson is extended until 26th January, 1956. 1/39103 Captain E. G. Ahern is seconded whilst undergoing post-graduate studies in the United Kingdom, 7th November, 1955.

### DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED DECEMBER 17, 1955.<sup>1</sup>

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	10(7)	1(1)	2	..	..	..	..	..	13
Amobiasis	..	1(1)	22	1(1)	..	..	..	..	1
Ancylostomiasis	..	..	..	..	..	..	..	..	23
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	2
Brucellosis	..	..	..	..	..	..	..	..	1
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	1(1)	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhoea (Infantile)	6(2)	15(9)	6(4)	..	1(1)	..	1	1	30
Diphtheria	2	7(6)	1(1)	..	4(4)	..	..	..	14
Dysentery (Bacillary)	..	2(2)	8(5)	..	2(2)	..	..	..	12
Encephalitis	2(1)	..	..	..	..	..	..	..	2
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	1(1)	..	..	..	..	..	..	1
Infective Hepatitis	49(30)	79(32)	..	10(4)	4(1)	..	1	..	142
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	..	..	..	..	..	..	1
Leptospirosis	..	..	..	..	..	..	..	..	..
Malaria	..	..	..	..	..	..	..	..	..
Meningococcal Infection	1(1)	3(2)	..	..	..	1	..	..	5
Ophtalmia	..	..	..	..	1	..	..	..	1
Crithrosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	3(2)	4(3)	1(1)	5(3)	5(3)	..	..	..	18
Puerperal Fever	1	..	..	..	..	..	..	..	172
Rubella	..	154(122)	1	16(15)	2(1)	..	..	..	..
Salmonella Infection	..	..	..	..	..	..	..	..	..
Scarlet Fever	17(14)	27(20)	5(1)	16(15)	2(1)	1	..	..	67
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	..	..
Trachoma	..	..	..	..	27(8)	..	..	..	37
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	35(16)	20(16)	5	5(4)	7(5)	6(3)	..	..	76
Typhoid Fever	..	..	2(1)	1(1)	..	..	..	..	2
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	1
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

<sup>1</sup> Figures in parentheses are those for the metropolitan area.

The provisional ranks of the following officers are confirmed: Captain 1/39148 F. Schubert, 1/62918 C. I. Wilkinson and 1/39171 N. J. Nicolaides.

#### Eastern Command.

*Royal Australian Army Medical Corps (Medical).*—To be Lieutenant-Colonel, 1st July, 1955: 2/146556 Major (Temporary Lieutenant-Colonel) A. G. Finley. To be Temporary Lieutenant-Colonel, 25th October, 1955: 2/52118 Major E. H. Hipsley.

#### Southern Command.

*Royal Australian Army Medical Corps (Medical).*—3/101835 Honorary Captain J. B. Drake is appointed from the Reserve of Officers, and to be Captain (provisionally), 30th September, 1955.

#### Central Command.

*Royal Australian Army Medical Corps (Medical).*—To be Captain (provisionally), 31st October, 1955: 4/32074 Allan John Day.

#### Western Command.

*Royal Australian Army Medical Corps (Medical).*—The provisional rank of 5/26525 Captain C. J. Benson is confirmed.

#### Tasmania Command.

*Royal Australian Army Medical Corps (Medical).*—To be Major, 26th October, 1955: 6/9210 Captain (Temporary Major) A. C. D. Corney and 6/5128 Captain D. B. Nathan.

### Honours.

#### NEW YEAR HONOURS.

The following medical practitioners have been included by Her Majesty the Queen in the New Year Honours list:

Dr. Charles George McDonald, of Sydney, has been created a Commander of the Most Excellent Order of the British Empire.

Dr. George Douglas Robb, of Auckland, New Zealand, has been created a Companion of the Most Distinguished Order of Saint Michael and Saint George.

### Nominations and Elections.

THE undermentioned have been elected as members of the New South Wales Branch of the British Medical Association: Annetts, David Lyle, M.B., B.S., 1955 (Univ. Sydney); Rowell, Charles Edward, M.B., B.S., 1955 (Univ. Sydney); Briscoe, Mary, M.B., B.S., 1954 (Univ. Sydney); Lilley, Leonard Bruce, M.B., B.S., 1954 (Univ. Sydney); McKessar, John Hubbard, M.B., B.S., 1954 (Univ. Sydney); De Marchi, Mario, registered in accordance with Section 17 (2) of the Medical Practitioners Act, 1938-1955.

### Deaths.

THE following deaths have been announced:

O'HALLORAN.—Charles Michael O'Halloran, on December 7, 1955, at Tingha, New South Wales.

GOLDMAN.—Joseph Goldman, on December 30, 1955, at Maroubra, New South Wales.

CHATFIELD.—Kenneth George Chatfield, on December 30, 1955, at Mornington, Victoria.

SEWELL.—Ian Blamyre Sewell, on December 22, 1955, at Brisbane.

ELLERY.—Reginald Spencer Ellery, on December 27, 1955, at Melbourne.

GIBSON.—James Gibson, on December 27, 1955, at Hobart.

BRUSTOLIN.—Norman Nerino Brustolin, on January 1, 1956, at Gunning, New South Wales.

### Medical Appointments.

Dr. A. M. Young has been appointed medical officer (female), Spastic Diseases, Hospital and Medical Services, Public Health Department, Tasmania.

Dr. Ian A. Shumack has been appointed an Official Visitor to Lachlan Park Hospital, New Norfolk, Tasmania.

Dr. W. Cotter B. Harvey has been appointed President of the New South Wales Medical Board.

Dr. A. M. Johnson has been appointed a member of the New South Wales Medical Board.

### Diary for the Month.

JAN. 16.—Victorian Branch, B.M.A.: Finance Subcommittee.

JAN. 17.—New South Wales Branch, B.M.A.: Medical Politics Committee.

JAN. 19.—Victorian Branch, B.M.A.: Executive of Branch Council.

JAN. 25.—Victorian Branch, B.M.A.: Branch Council.

JAN. 27.—Queensland Branch, B.M.A.: Council Meeting.

### Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.I.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all contract practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

### Editorial Notices.

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